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. "\$%"')* % , "%).01357,)95) "" ; <%
95.< 7,>7

1. \$ 3 9"35,)1"<,)95. – 53, "%35>7

" #\$\$%&(*+%,./"0\$.(,1 +34*56\$+&.+\$.34 070,8+\$".+,8 #\$\$%\$6&+: #78\$6\$

\$ 3 9"35,)1"<,)95. '*) "0% ')')*)		
\$?@ACEF@GI	;3(*%"8<4 #=3>2.(<4	?*==,8+"6<4 #=3>2.(<4
A=3>2.(<4 (B&+,"6,")	12.000	24.000
?D.3 3(*%E."\$ 6\$+\$8&=:.3 ((³ /6\$+/3()	0,150	0,150
?D.3 3(*%E."\$ 6\$+\$8&=:.3 ((³ /3()	1800	3600
?D.3 3(*%E."\$:% "\$7\$#\$%,/E \$6\$>&%+:8 ((³ /F%\$)	75,00	150,00
?D.3 3(*%E."\$ #\$\$%,/E =2(&+:8 (= "≠0=)	20,83	41,67
;28+*=*.+E4 \$"/(E4	3,00	3,00
A\$%,/E \$"/(E4 ((³ /F%\$)	225,00	450,00
A\$%,/E \$"/(E4 (= "≠0=)	62,49	125,01
A\$%,/E \$"/(E4 (= "≠0=) (G\$(H&8*+\$")	62,00	125,00
\$?@GJKL@MN?OFIQRDG@FUSQJW@ WQ		
BOD ₅	720,0	1.440,0
SS	840,0	1.680,0
TKN	120,0	240,0
P	36,0	72,0
)MVQEOF@RXEIG@MN?OFIQRDG@FUSQmg/ YIF)		
BOD ₅	400	400
SS	467	467
TKN	67	67
P	20	20

IS <%"\$6%,F8 070,8+\$".+,8 *#<(*8, #78\$6\$

\$#@ACEF@GI	'ICKL ZAXW "\$5	9GOA[EL
PH (.+"5("\$7\$(D+%3.3)	6, 8,5	mg/l
BOD ₅	< 25	mg/l
COD	< 125	mg/l
K":%,1(*8\$.+*%*&SS	< 30	mg/l
="6< &M:+,	< 15	mg/l
NF.O,%,4	< 10	mg/l
="6& 6,=,H\$6+3%",*"0E	<1000	cfu / 100 ml
B,#%\$8F03 6,=,H\$6+3%",*"0E	<200	cfu / 100 ml

2. '"17,%* \$"3,03 * .\,)' 9"7*) "";

2.1 9K]G[GL "NE^E@V?XU?L <MO?CIQ_FWF?

K8+"6*7(*8, \$2+,1 +,2 +(E(\$+,4 +,2 D%5,2 *78\$" 3 \$#,&6%28.3 (D%,24 +,2 2O".+&(*8,2 P/? *R,#=".(,1 =<5: #=\$="\$<+3+\$4 E O2.",=,5"6E4 O>,%&4 6\$" 3 \$8+"6\$+&.+\$.E +,2 (* 8D, .15/%,8, 6\$" *8*%5**\$6&\$#,0,+"6<+*%,, 5"\$+38 H*="+.+,#73.3 +34="+,2%57\$4,2.

" +*/8"6D4#%,0"\$5%\$OD4#"=D/>36\$8(* H&.3:

1. I38 *8 "/1 KSA
2. I38 ,%"+6E(*=D+3+,2 6\$+\$.6*2\$. (D8,2 D%5,2
3. I38 \$%,(8"6E *8.:(&+:.3 +,2 *R,#=".(,1 .+, D%5,(* +38 *=&/" +3 0"\$+\$\$%\$/E .+38 6\$8,8"6E="+,2%57\$34SSG6\$+&+3 O&.3 +:8 *%5\$."F8
4. I38 #,=1 .3(\$8+"6E *(#"%"7\$#,2 D/" \$#,6+3>*7 \$#< +38 (D/" +F%\$="+,2%57\$+:8 SSG6\$"+\$ #%,H=E(\$+\$\$#,2 6\$+&6\$"%1,14D/,28 \$8\$61U*"
5. I38 0"*>8EH"H=",5%\$OD4#">F4 6\$"+4#%<.O\$+*4*R*=7R*"434+*/8,=,57\$4

I, \$8+"6*7(*8, +:8 #%,0"\$5%\$OF8+,2 #\$\$%<8+,46\$" +34 *6+D=*.34 +:8 D%5:8 #,2 #%,H=D#,8+\$" \$O,%& .+38 \$8+"6\$+&.+\$.3/\$8\$H&>(" .3 3=*6+%,(3/\$8,=,5"6,1 *R,#=".(,1 #,2 #\$\$"+*7+\$5"\$ +38 ="+,2%57\$34SSG 2O".+&(*8,4 P? *R,#=".(,1 *6+<4 \$#< +"4 O>,%D4#,2 D/" 2#,.+*7 =<5: #=\$="\$<+3+\$4D/" 2#,.+*7 6\$" .3(\$8+"6D40"\$H%F.*"4#,2 +,8 6\$>".+,18 *7+*(3 ="+,2%5"6<7+*(3 \$#,0,+"6<.

I, D%5,#*%="\$ (H&8*+\$ \$6<=,2>\$:

1. I38 #%,(E>*" \$ 6\$" *56\$+&.+\$.3 ,#,"20E#,* *R,#=".(,1 #%,H=D#*+\$"+\$ I*1/3 V3(, #%&+3.34 .2(#*%="\$ (H\$8,(D8:8 +:8 *%5\$."F8 \$#,RE=: .34 +,2 2O".+&(*8,2 *R,#=".(,1 6\$" \$#\$"+,1(*8:8 *#(H&.*:8 /%5\$."F8 5"\$+38 *56\$+&.+\$.3 +,2 8D,2. *R,#=".(,1 #,2 \$#,R3=F8*+\$">\$,035*7+\$" 6\$>' 2#<0*"R3+34 *#7H=*U346\$" (* (D%"(8\$+,2 \$8\$0</,2 . * \$#,>36*2+"6< /F%, *8+<4+34SSG ;+38 2#/,%D: .3 +,2 \$8\$0</,2 *78\$"6\$" 3 #%,*+,"(\$7\$ +,2 2="6,1 5"\$ (\$6%&\$#,>E6*2.3 (6\$>\$%".(<4 6=#)

2. I38 *6+D=*3 +:8 *%5\$. "F8 (* H&.3 +\$ #%,H=*#<(*8\$.+\$ I*1/3 V3(,##%&+3.34. S78\$#\$#<=2+3*2>183 +,2 K8\$0</,2 8\$ +3%E.*"#="#=D,8+"4,0357*4 #,2 #%%D/,8+\$" .+\$ I*/8"6& S5/*"%70"\$,2 6\$+\$.6*2\$.+E +,2 6&>*+(E(\$+,4 *R,#=".(,1
3. I38 #%, (E>*" \$ 6\$" *56\$+&.+\$.3 ,#, "20E#,+* 2="6,1 6\$" ("6%,X="6,1 #,2 0*8 \$8\$OD%*+9%3+&+\$ I*1/3 V3(,##%&+3.34 6\$" *78\$"\$#\$%\$7+3+5"\$+38 ,=,6=E%.:3 +34*56\$+&.+\$.34 :4 ="+,2%5"6,1.28<=,2
4. Z"\$ +, /%,8"6< 0"&.+3(\$ #,2 >\$ 0"\$%6D.,28, " *%5\$.7*4\$#,RE=:34 2O".+&(*8,2 *R,#=".(,1 6\$" +, #,>D+3.34 8D,2 >\$ #D#*"8\$ #%,H=*O>*76\$" 8\$ *O\$%(,.*7 .1.+3(\$ #%%&6\$(U34E 0"\$6,#E4 %,E4(* (D.\$ +,2 \$8\$0</,2 F.+* 8\$ *R\$.O\$=".*7 3 *1%2>(3 6\$" \$0"&="#+3="+,2%57\$+34 SSG(\$%&==3=*4*R\$(*8D46\$+&==3=,2 <56,2, \$8+=7*4.:38F.*"4 , (\$\$=<8"\$ D(O%\$R34=38F.*:8 6=#)
5. I3 .18+\$R3 ./*07:8 "[4 6\$+*.6*2&.>3.\$8 - As built" 2#,.+3%"M<(*8\$ \$#< O:+,5%\$O"6E\$#,+1#:.3
6. I38 \$%/"6E%1>("3, 0,6"(E 6\$" >D.3 . * ="+,2%57\$+34 *56\$+&.+\$.34 (* H&.3 +\$ #%,H=*#<(*8\$.+\$ I*1/3 V3(,##%&+3.34, .+\$ *5/*"%70"\$+:8 6\$+\$.6*2\$.+F8 +,2 *R,#=".(,1 6\$" .+,24 ./*+"6,14 6\$8,8".(,14 , 6\$>F4 6\$" +38 *6\$70*2.3 +,2 #%,.:#"6,1 #,2 >\$ *#="*5*7.+3 ="+,2%57\$+34 .28+E%3.3 +,2 *R,#=".(,1

Z"\$ +38 2O".+&(*83 *56\$+&.+\$.3 *#*R%5\$.7\$4=2(&+:8 +34 #*%"/,E4 +:8 D%5:8 D/*" *#="*5*7 3 (D>,0,4 +34 *8*%5,1 "=1,4 (* #%%\$+*+\$(D8, \$*%".(< 6\$" +\$2+</%,83 H",=,5"6E\$#,(6%28.3 \$MF+,2 6\$" O:.O<%,2 . I, .1.+3(\$ E03 *O\$%(<M*+\$.1(O:8\$ 6\$" (* +,24 #*%"H\$==,8+"6,14<%,24 +34 \$%"> 775/357/9-3-2000 \$#<O\$.34 +34 V].AS. _[. A*%"OD%*"B*8+% "6E4\$6*0,87\$4. P #%%,1.\$ I*/8"6E A*%"5%\$O\$O,%&+38 \$8\$H&>("3 +:8 *56\$+\$.+&.*:8 +34 S.S.G 3 ,#,7\$ H%7.6*+\$. * ="+,2%57\$+34 >F4 6\$" .+38 *#D6+\$E +34

P 2O".+&(*83 SSGD/*" 028\$("6<+3+\$ 12.000 \$+<(:8 , D/*" 0* E03 *R\$8+=E.*" +3 028\$("6<+3+& +34 +<., \$#< 20%\$2="6E*#&%6*\$<., 6\$" \$#< 028\$+<+3+\$ H",=,5"6E4 *#*R%5\$.7\$4+:8 =2(&+:8 .

P 2O".+&(*83 *56\$+&.+\$.3 *#*R%5\$.7\$4=2(&+:8 \$#,+*=*7+\$" \$#< +"4 \$6<=,2>*4 2#,(8&0*4 :

- S./&%.:3 (* #*%".+%*O<(*8, 6<.6"8,

- K%"M<(*8,4K((,.2==D6+34
- N%*&+",(*%".(,1 H",=,5"6E4H\$>(70\$4
- ?,8&0\$ H",=,5"6E4 *#*R%5\$.7\$4 (H",*#",=5E - \$#,8"+%,#,73.3 - 8"+%,#,73.3
\$8\$626=,O,%7\$8"+%"6F)8
- K8+=",.+&.", \$8\$626=,O,%7\$4\$"\$#,(86%28.34 "=1,4
- V*R\$(*8E 6\$>7M3.34
- K8+=",.+&.", *#*#="<8+:8
- K#,,=1(\$8.3 (/=:7%.3)
- N%*&+",*R<0,2
- V*R\$(*8E (*+\$#,8"+%,#,73.34 (2O7.++\$+\$.8 6+"%"\$6\$==&0*8 /%3."(,*,*7+\$")
- V*R\$(*8E #8/28.34
- K8+=",.+&.", \$#,(86%28.34 #\$/2(D834 =&.#34 #%,46=78*4
- K8+=",.+&.", 0"\$25\$M<8+:8#\$/28+E =&.#34
- a3%\$8+"6D8=78*4
- K8+=",.+&.", .+>%\$55"07:86="8F8RE%\$8.34
- B+7%"R,#=".(,1
- B+7%"Q2.3+E%:8 \$*%".(,1

Z"\$ +38 *#*R%5\$.7\$25%F8 \$#,H=E+:8 +34 .256*6%"(D834 (,8&0\$4 *O\$%(<M*+\$"
6\$+& .""%& (3/\$8"6<4, H",=,5"6<4 6\$>\$%".(<4 6\$" .+&0", \$#,=1(\$8.34 . P (D>,0,4
*#*R%5\$.7\$4/*":4 *RE4

\3" ',5 ",)5<5. - ")1 3>)*

I\$ =1(\$+\$ (D.: +,2 6\$+\$>="#+"6,1\$5:5,1 +,2 6*8+%"6,1\$8+=",.+\$.7,2 (*+\$O,%&4
+:8 =2(&+:8 +,2 VE(,2 b. ?,20\$8"F8 ,035,18+\$" .+, O%*&+",*".<0,2 . I, O%*&+",
*".<0,2 (D.: 6\$+&==3=34#""*M,>%\$2.+ "6E40"&+\$R34/%3."(*1"" 5"\$ +38 \$8&./*.3 +34
6"83+"6E4*8D%5""\$4+:8 =2(&+:8 . K#< +, O%*&+",*".<0,2 +\$ =1(\$+\$,035,18+\$" .+,
\$2+,6\$>\$%"M<(*8,*%".+%"O<(*8, 6<.6"8, .

I\$ =1(\$+\$ *".D%/ ,8+\$" .+3 0*R\$(*8E +%,O,0,.7\$4 +,2 #*%".+%"O<(*8,2
+2(#&8,2 , 6\$" .+3 .28D/*"\$ (D.\$ \$#< +,8 61="80%,#,2 #*%".+%"DO*+\$%5&(9 . .\$.=).

I\$.+*%*& .:(\$+70"\$.256%\$+,18+\$" #&8: .+38 *R:+*%"6E *#"O&8*\$ +,2
62=780%,26\$" \$#,\$(\$6%18,8+\$" (* +38 H,E>*\$ "0"6,1 RD.+,%,2#%,4+,8 6,/=7\$.2(#7*.34
6\$" (*+\$O,%,&4*./\$%".(&+:8 , , #,7,4 +\$ \$#,%%7#+*% +%,/E=\$+, 6&0, \$#,%%%"(&+:8.

I, 8*%<#*%8&*\$#\$< +\$ \$8,75(\$+\$ +,2 +2(#&8,2 (2 mm) 6\$" H5\$78*\$#\$< +, 6&+:
(D%,4 #%,4 #*%\$" +D%.*#R*%5\$.7\$ I, 6<.6"8, OD%*%*:+*%"6< .1.+3(\$ U*6\$.(.1 (*
*#+&\$6%,O1."\$, 5"\$+\$+,8 6\$>\$%".(< 6\$" +38 \$#,O25E *(O%&R*:8.

;* #*%7#+:3 H=&H34E .28+E%3.34 +,2 O7=+%,2+\$ =1(\$+\$ 2#*%/"=7M,28+,
6\$8&="+34.++\$+"6E4./&%%\$4.

;EIFGM@VIQQ?FAXF?XW

I, 2O".+&(*8, #*%".+*%O<(*8, +1(#\$8, *./&%:34 #\$\$%,2."&M*" *6+*+\$(D83
0"&H%:3, 3 =*"+,2%57\$+,2 +2(#&8,2 *78\$".28*/E4 , 6\$>F4 0*8 2O7.++\$+"\$2+,\$+").(<4
\$87/8*2.34 .+&>(34 +:8 *%".*%/, (D8:8 =2(&+:8 .+3 0*R\$(*8E +%,O,0,7\$4 +,2 +2(#&8,2
E \$2+,\$+").(<4 0"\$6,#+<(*834 =*"+,2%57\$4\$"+\$ \$8,75(\$+\$ +,2 +2(#&8,2 #\$\$%,2."&M,28
6++\$(D83 D(O%\$R,3 6\$>F4 0*8 =*"+,2%5*7+, .1.+3(\$ U*6\$.(.1 , (* \$#,+D=*.(\$ +\$
=1(\$+\$ 8\$ 2#*%/"=7M,28

6,/=7\$4 (*+\$O,%,&46\$".2(#7*.34 *./\$%".(&+:8 #\$\$%,2."&M*"6+*+\$(D8*40"\$%%%,D4
+:8 .+%%\$55".(&+:8 +:8 *./\$%".(&+:8 , =<5: 0"&H%:34 6\$" O>,%D4+,2 .#*%*,*0,14
6,/=7\$ (* \$#,+D=*.(\$ 8\$ (38 #%%\$5(\$+,#,"*7+\$".2(#7*.3 +:8 *./\$%".(&+:8 . P =*"+,2%57\$
+,2 6,/=7\$ *78\$".28*/E4 , 6\$>F4 0*8 =*"+,2%5*7\$ \$2+,\$+").(<4 0"\$6,#+<(*834 =*"+,2%57\$4

995).;;50* - ;,\$5).;;50*

;+3 .28D/*"\$ +\$ =1(\$+\$ 0"D%/ ,8+\$" \$#\$< 0702(, \$*%"M<(*8, \$((,.2==D6+3 -
 ="#,.2==D6+3<#,2 \$#,\$6%18*+" 3 &((,4 6\$" +\$ =7#3

O \$((,.2==D6+34 -="#,.2==D6+34 #*%"=(H&8*"01, <(*4 #\$\$%&==3=*40*R\$(*8D4
 "0"6E40"\$+,(E4. #2>(D8\$4+346&> 0*R\$(*8E4.* <=, +, (E6,4 +,2 6\$" #*%"..<+*%, \$#\$<
 +38 (" \$ #=*2%&*78\$"0"\$(\$,%O:(D8,4 (* (*5&=3 6=7.3 . /3(\$+7M,8+\$4 (" \$.+*8E 0"\$(E63
 \$1=\$6\$, <#,2 .2...%*1*+" 3 6\$>"M&8,2.\$&((,4 .

S#7.34 , " 0*R\$(*8D4OD%,28*.:+*"6& 6\$" 6\$>' <=, +, (E6,4 +,24 *(H\$#+".(D8,
 +,"/7,, #,2 .6,#< D/*" 8\$.256%\$+*7\$#< +38 #=*2%&+,2 #2>(D8\$ (* +38 (*5\$=1+*%36=7.3
 +\$ =7#36\$" +\$ D=\$"\$#,2 0"\$/:%7M,8+\$(* +3 H,E>*" \$ +,2 #\$\$%*/<(*8,2 \$D%\$6\$" *#"#=D,28
 .+38 *#"O&8*" \$

Z"\$ +,8 \$*%".(< +:8 >\$=&(:8 \$((,.2==,5E4 D/*" +,#,>*+3>*7 076+2, 0"\$ /2+F8
 (*.\$7\$4 O2.\$=70\$4 +1#,2 626=F8\$ 6\$+& (E6,4 +34 0*R\$(*8E4 " O2.\$=70*4 \$D%,\$
 #%,.070,28 .+\$ =1(\$+\$ (7\$ 626="6E.#*%",*"0E +%,/"& #,2 .8\$ \$#,+D=*.(\$ D/*" +,8
 0"\$/:%".(< +34 &((,2 \$#\$< +\$,%5\$8"6&.:(\$+70"\$ #,2 *78\$" +2/<8 #%,.6,==3(D8\$, =<5:
 0"\$O,%*+"6,1*"0"6,1 H&%,24

P #\$\$%,/E \$D%\$+, .1.+3(\$ 0"&/2.34 578*+"\$#\$< +*%"4(2+1) O2.3+E%*4+1#,2
 #=*2%"6,16\$8\$=",1.

P &8+=3.3 +34 .2==*5<(*834 &((,2 \$#< +38 \$1=\$6\$ +,2 #2>(D8\$ 578*+\$(* +38
H,E>*" \$ 01, 2#,H%2/7:8 \$8+= "F8(* #+*%:+E +1#,2 Vortex F.+* 8\$ (38 O>*7%*+\$\$#< +38
&((, . B&>* \$8+=7\$>\$ *78\$"\$8\$%+3(D83+38 6"8,1(*83 5DO2%\$+,#,>*+3(D83 .+38 .+DU3
+:8 0*R\$(*8F8. K#< +3 5DO2%\$ \$ *78\$"\$7.34 \$8\$%+3(D8\$01, RD.+%\$#"O\$8*7\$4+\$, #,7\$
>\$.%F8,28 +\$ *\$"#=D,8+\$=7#36\$ "D=\$"\$+,8 /F%, *#7#=*2.34.

P \$8+=,1(*83 &((,4 ,035*7+\$". * #=*2%"6-6\$8&=\$#< +, ,#,7, ,035*7+\$"(* O2."6E
%,E .+,8 0"\$/:%".+E &((,2 (sand classifier). P 0"\$/:%"M<(*83 &((,4 \$#,%%7#+++\$".
+%,/E=\$+, 6&0, \$#,%%"((&+:8.

;+, +D=,4 +:8 >\$=&(:8 \$(,2==,5E4 +\$ =1(\$+\$ 0"D%/ ,8+\$" (D.: 01,
2#*%/"=" .+F8 =*#+E4 .+DU34 6\$ " ".D%/ ,8+\$" .+,8 0"\$8,(D\$ %,E4 #%,4 +"4 0*R\$(*8D4
H",=,5"6E4*#*R*%5\$.7\$4

;EIFGM@VIQ`Q?FAXF?XW

P (,8&0\$ \$(,2==,5E4 - ="#,2==,5E4 *78\$"*6+<4 =" +,2%57\$4\$," 0*R\$(*8D4
78\$"#=E%:4#"/:(D8*4 (* &((, 6\$ "O*%+&2="6&

P 5DO2%\$.+38 ,#,7\$ *78\$"\$8\$%+3(D8\$+\$ 01, RD.+%\$#"O\$8*7\$4.&%:.34 +:8
*#">#=*8+:8 ="#F8 6\$ "=\$7:8 .+,8 /F%, *#7#=*2.34 6\$," 01, 2#,H%1/"*4 \$8+=7*4\$"+38
&8+=3.3 +34 .2==*5<(*834 .+,8 #2>(D8\$ +:8 \$(,2==*6+F8 &((,2 0*8 6"8*7+\$" "
3=*6+%,(*":+E%*46783.34+345DO2%\$4\$"+:8 RD.+%:8*#"O\$8*7\$478\$"6\$+*.+%\$((D8,". P
5DO2%\$ \$%,2."&M*6*+\$(D830"&H%:.3.

#\$\$%*/<(*8,4 \$D%\$4+, .1.+3(\$ 0"&/2.34 +:8 \$((,.2==*6+F8 (D.: +:8 +%F8
 (3) 2O".+&(*8:8 O2.3+E%:8, +1#2 #=*2%"6,1 6\$8\$="1, 0*8 *#\$\$%6*7 (* \$#,+D=*.(\$,"
 O2.3+E%*48\$ *78\$*6+<4="+,2%57\$4
 SR\$"+7\$434\$#,2.7\$4 \$*%".(,1 , , " 01, (2) 2#,H%1/"*4 \$8+=7*4"\$ +38 &8+=3.3 +34
 .2==*5<(*834 .+,8 #2>(D8\$ +:8 \$((,.2==*6+F8 &((,2 0*8 ="+,2%5,18
 I, .1.+3(\$ 0"&/2.34 \$D%\$ 0"\$2+D4 .:=38F.*"4 , +:8 \$((,.2==*6+F8 *78\$"
 R\$"%+"68"\$H%:(D8,.
 6,/=7\$4 0"\$:/:%".(,1 &((,2 0*8 ="+,2%5*7 3=*6+%,(*":+E%\$4+,2 6,/=7\$ *78\$"
 6\$+*.+%(D8,4 6\$" , 6,/=7\$4 #\$\$%,2."&M**"6+*+\$(D8*4 0"\$%%,D4:8 .+%%\$55".(&+:8 +34
 &((,2 , =<5: 0"&H%:.34.
 P 3=*6+%,5"6E *56\$+&+\$.3 +34 (,8&0\$4 , 6\$=:0"F.*"4 6\$" 3=*6+%"6<4#78\$6\$4
 78\$6\$+.+%(D8\$ 6\$"/%EM,28#=E%,24\$8+"6\$+&+\$.34

a,5;50,%* "\$"c"30),

P (D>,0,4 H",=,5"6E4 ***R*%5\$.7\$4 *78\$ " \$2+E +,2 #\$\$%\$+*+\$(D8,2 \$*%".(,1 .
S#"#=D,8 #%%\$5(\$+,#,"*7+\$" \$#,(86%28.3 \$MF+,2 (* #%, \$#,8"+%,#,73.3 (03(",2%57\$
\$8,R"6F8M:8F8 #%"8\$#< +"4,R25,8,1/*4 MF8*4.

P d",=,5"6E ***R*%5\$.7\$ #*%*%=\$(H&8*"01, (2) 5%\$((D4 ***R*%5\$.7\$4 f6\$.+3
5%\$((E H",=,5"6E4***R*%5\$.7\$4\$#*,+*=*7+\$"#\$< #D8+*0"\$0,/"6D4(cascade) 0*R\$(*8D4:

- V*R\$(*8E H",*#",=,5E4
- V*R\$(*8E \$#,8"+%,#,73.34
- V*R\$(*8E *#\$\$(O,+*%7M,2.\$4=*"+,2%57\$4
- V*R\$(*8E 8"+%,#,73.34(\$*%".(<4)
- V*R\$(*8E 8"+%,#,73.34(\$*%".(<4)

P = "*" + 2%5"6E" & + \$R3:8 0*R\$(*8F8 O\$78*+\$" + , #\$\$%\$6&+ : /D0" , :

S]; V ; K' ZgK??P;	d] SA]G ZP	KA b]lg A]P;P	- SAK?N IS g]i k;K G	- b]lg A]P;P (KSg];? ;)	b]lg A]P;P (KSg];? ;)	Sa V ; K' ZgK??P
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S]; V ; d' ZgK??P;	d] SA]G ZP	KA b]lg A]P;P	- SAK?N IS g]i k;K G	- b]lg A]P;P (KSg];? ;)	b]lg A]P;P (KSg];? ;)	Sa V ; d' ZgK??P
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P 0*R\$(*8E H" , *# = , 5E4 *78\$ " \$ # \$ % \$ 7 + 3 + 3 " \$ + , 8 D = * 5 / , + 34 0 " < 56 : . 34 = & . # 34
(Bulking Sludge) # , 2 , O * 7 = * + \$ " . + \$ 83 (\$ + , * " O E H \$ 6 + E " (Filamentous) . H \$ % / E = * " + , 2 % 57 \$ 4
+ 34 H \$. 7 M * + \$ " . + , 8 * (# = , 2 + " . (< + 34 \$ 8 \$ 626 = , O , % , 1 (* 834 = & . # 34 (* + % , O E F . + * 8 \$
\$ 8 \$ # + 2 / > * 7 * 56 \$ 7 % : 43 25 " E 4 H " , (& M \$. * H & % , 4 + : 8 83 (\$ + , * " O F 8 H \$ 6 + 3 % " 07 : 8

? D . \$. + 3 0 * R \$ (* 8 E * # = , 5 E 4 3 \$ 8 \$ 626 = , O , % , 1 (* 83 = & . # 3 \$ 8 \$ (" 581 * + \$ " (* O % D . 6 \$
= 1 (\$ + \$ 6 \$ " 578 * + \$ " , # \$ % \$ 7 + 3 + , 4 (# = , 2 + " . (< 4 + 34 H " , (& M \$ 4 . * + % , O E ? * + , 8 + % < # , \$ 2 + <
(* " F 8 * + \$ " 0 % \$. + " 6 & 3 # " > \$ 8 < + 3 + \$ 0 " < 56 : . 34 = & . # 34 (Bulking Sludge) .

I , (E 6 , 4 6 & > * 0 * R \$ (* 8 E 4 H " , * # = , 5 E 4 * 78 \$ " 5.0 m , + , # = & + , 4 2.0 m 6 \$ " + , H & > , 4
25 % , 1 3.4 m . * 8 * % 5 < 4 < 56 , 4 # % , 61 # + * " 34 m³ / 0 * R \$ (* 8 E 6 \$ " . 28 , = " 6 & 68 m³ 5 " \$ + " 401 ,
0 * R \$ (* 8 D 4

B & > * 0 * R \$ (* 8 E H " , * # = , 5 E 4 H % 7.6 * + \$ " . * E # " \$ \$ 8 & 0 * 2.3 (D : : 2 # , H % 2 / 7 , 2
\$ 8 \$ (" 6 + E % \$ " . / 1 , 4 0.8 KW , . 18 , = , 2 \$ 8 \$ 0 * 2 + E % * 4

; + 3 0 * R \$ (* 8 E \$ # , 8 " + % , # , 73.34 + \$ 8 " + % F 036 \$ " 8 " + % " 6 & = \$ + \$ # , 2 # % , D % / , 8 + \$ " \$ # <
+ 38 , R * 70 : . 3 + 34 \$ ((: 87 \$ 4 . + " 4 0 * R \$ (* 8 D 4 \$ * % " . (, 1 \$ 8 & 5 , 8 + \$ " . * \$ D % " , & M : + , \$ # <
0 " & O , % , 24 (" 6 % , , % 5 \$ 8 " . (, 14 . * \$ 8 , R " 6 < # * % " H & = = , 8

Z " \$ + 38 H " , / 3 (" 6 E 0 % & . 3 + 34 \$ # , 8 " + % , # , 73.34 \$ # \$ " + * 7 + \$ " 3 # % , > E 63 , % 5 \$ 8 " 6 , 1
& 8 > % \$ 6 \$ I , H \$. " 6 < # = , 8 D 6 + 3 (\$ + 34 (* > < 0 , 2 # % , \$ # , 8 " + % , # , 73.34 , 03 = . + 34 + , # , > D + 3.34
+ 34 \$ # , 8 " + % , # , 73.34 # % " 8 + , 8 \$ * % " . (< * 78 \$ " < + " . \$ 8 # 35 E & 8 > % \$ 6 \$ / % 3 . " (, # , " * 7 + \$ " ,
, % 5 \$ 8 " 6 < 4 & 8 > % \$ 6 \$ 4 + : 8 \$ 8 * # * R D % 5 \$. + : 8 \$ # , H = E + : 8 # , 2 * " . D % / , 8 + \$ " . + 38 0 * R \$ (* 8 E
\$ # , 8 " + % , # , 73.34 .

Z " \$ 2 U 3 = E \$ # < 0 , . 3 + 34 H \$ > (70 \$ 4 \$ # , 8 " + % , # , 73.34 \$ # \$ " + * 7 + \$ " \$ 8 \$ 626 = , O , % 7 \$
* # " # = D , 8 # , < + 3 + \$ 4 \$ 8 & (" 6 + , 2 25 % , 1 # = , 1 . " , . * 8 " + % " 6 & # < + 38 D R , 0 , + : 8 0 * R \$ (* 8 F 8
\$ * % " . (, 1 . + 38 * 7 . , 0 , + : 8 0 * R \$ (* 8 F 8 \$ # , 8 " + % , # , 73.34 . P \$ 8 \$ 626 = , O , % 7 \$ 578 * + \$ " (*

2#,H%1/"*4\$8+=7*4 \$#\$"+,1(*8,4 %2>(<4\$8\$626=,O,%7\$4*78\$"#*%7#,2150% +34(D.34
#\$\$%,/E4 +:8 =2(&+:8 .

P \$8\$626=,O,%7\$8&("6+,2 25%,1 578*+\$(* 2#,H%1/"*4\$8+=7*456. "/,1,4 3.1 kW
D6\$.+3 ;* 6&>* 5%\$((E *#*R*%5\$.7\$42#&%/,28 2 \$8+=7*41 61%"\$1 *O*0%"6E .18,=, 4
\$8+=7*4

I, (E6,4 6&>* 0*R\$(*8E4 \$#,8"+%,#,73.34 *78\$5.0 m, +, #=&+,4 7.68 m 6\$" +,
H&>,4 25%,1 3.4 m. *8*%5<4<56,4 #%,61#+*"131 m³ / 0*R\$(*8E 6\$" .28,="6& 262 m³ 5"\$
+"401, 0*R\$(*8D4 <56,4 +34 \$#,8"+%,#,73.34 \$#,+*=*7 #*%7#,2+, 13% +,2 .28,="6,1
<56,2 +34H",=,5"6E4*#*R*%5\$.7\$4

B&>* 0*R\$(*8E \$#,8"+%,#,73.34 H%7.6*+\$".* E#\$ \$8&0*2.3 (D.: 2#,H%2/7,2
\$8\$("6+E%\$"/,1,4 1.5 KW, .18,=, 2 \$8\$0*2+E%*4

P 0*R\$(*8E *#\$(O,+*%7M,2.\$4 =*"+,2%57\$D/*" +38 028\$+<+3+\$8\$ =*"+,2%5*77+*.:4
\$#,8"+%,#,73.3 7+*.:4 \$*%".(<4, \$8&=,5\$ (* +4\$8&56*4+34 *56\$+&+\$.34 #%,.070,8+\$4
2="R7\$+3 =*"+,2%57\$34 *56\$+&+\$.34.

" 0*R\$(*8D4 \$#,8"+%,#,73.34 6\$" *#\$(O,+*%7M,2.\$4 =*"+,2%57\$4*#"6,"8:8,18
(*+\$R1 +,24 (* 2#,H%1/"\$ \$8,75(\$+\$ 1.0 m x 1.0 m.

I, (E6,4 6&>* 0*R\$(*8E4 *#\$(O,+*%7M,2.\$4 =*"+,2%57\$478\$5.0 m, +, #=&+,4 9.9
m 6\$" +, H&>,4 25%,1 3.4 m. *8*%5<4<56,4 #%,61#+*"168 m³ / 0*R\$(*8E 6\$" .28,="6&
336 m³ 5"\$ +4 01, 0*R\$(*8D4 <56,4 +:8 0*R\$(*8F8 *#\$(O,+*%7M,2.\$4 =*"+,2%57\$4
\$#,+*=*7 #*%7#,2+, 17% +,2 .28,="6,1 <56,2 +34H",=,5"6E4*#*R*%5\$.7\$4

B&>* 0*R\$(*8E OD%*2#,H%1/", \$8\$("6+E%\$5"\$ \$8&0*2.3, "/,1,4 1.5 KW, .18,=, 2
\$8\$0*2+E%*4 S#7.34 D/*" 6\$" .1.+3(\$ 0"&/2.34 \$D%\$(* #=E%30"&+%.:3 +,2 #2>(D8\$
\$#< 0"\$2+D4(#268<+3+\$1.4 0"\$/. /m²).

K#< +4 0*R\$(*8D4 *#\$(O,+*%7M,2.\$4 =*"+,2%57\$4+\$ =1(\$+\$ *".D%/ ,8+\$" .+"4
\$8+7+, "/*4 0*R\$(*8D4\$*%".(,1 (D.: 2#,H%1/" :8 \$8,"5(&+:8 1.0 m * 1.0 m.

;+"4 0*R\$(*8D4 \$*%".(,1 +\$ =1(\$+\$ D%/ ,8+\$" .* *#\$OE (* 6\$=="D%5*\$"
("6%,,%5\$8".(F8 (*8*%5<4"=14 #,2 (* +38 /%E.3 0"\$=2(D8,2 ,R25<8,2 ,R**0F8,28 +4
,%5\$8"6D48F.*"4 6\$" \$#,\$6%18,28 +, %2#\$8+"6D,%,+7,

S6+<4\$#< +38 ,R*70:.3 +:8 ,%5\$8"6F8 *8F.*:8 .+"4 0*R\$(*8D4#%\$5(\$+,#,"*7+\$"
6\$" #=E%34H",=,5"6E ,R*70:.3 , (* +38 H,E>*"\$ ("6%,,%5\$8".(F8 (8"+%,H\$6+3%"07):8+34
\$(:87\$4 .* 8"+%"6&=\$+\$ I, (E6,4 6&>* 0*R\$(*8E4\$*%".(,1 *78\$9,85 m, +, #=&+,4 9,90
m 6\$" +, H&>,4 25%,1 3,40 m. *8*%5<4<56,4 #%,61#+*"332 m³/ 0*R\$(*8E 6\$" .28,="6<
1.326 m³ 5"\$ +4+D..*%"40*R\$(*8D4

.28,="6<4 *8*%5<4<56,4 +:8 0*R\$(*8F8 \$#,8"+%,#,73.34 - *#\$(O,+*%7M,2.\$4
="",+2%57\$4 8"+%,#,73.34#%,61#+*"1924 m³.

I, \$#\$"+,1(*8, 5"\$ +38 H",#\$,"6,0<(3.3 ,R25<8, 6\$>F4 6\$" 3 \$8\$56\$7\$"/14
\$8&0*2.34 +:8 =2(&+:8 #\$\$D/,8+\$"#\$< .1.+3(\$ 2#,H%1/"\$40"&/2.34 .

I, .1.+3(\$ \$2+<\$#,+*="7+\$"#\$<:

- V1, (2) O2.3+E%*4=,HF8 #\$\$,/E4 1,200 Nm³/hr D6\$.+,4 .+\$ 450 mbar.

- ;:=38F.*"4 6\$+\$8,(E4

- 720 0"\$/2+D4 U"=E4 O2.\$=70\$4 *=\$.+"6E4 (* (H%&834 .+,8 #2>(D8\$ +:8
0*R\$(*8F8 \$*%".(,1 .

K#< +"40*R\$(*8D4\$*%".(,1 +\$=1(\$+\$ 2#*%/"=7M,22#*%&8: 2#*%/"="."F8 =*#+E4
.+DU34.* 6\$8&="2#*%/*7="."34(* 6*6="(D8, #2>(D8\$ 6\$" 6\$+\$=E5,28.+, O%*&+"0"\$8,(E4
%,E4#%,4+3 0*R\$(*8E 6\$>7M3.34

;EIFGM@VIQ`Q?FAXF?XW

" 01, (2) 2#,H%1/" , " \$8\$("6+E%*4+:8 0*R\$(*8F8 H",*#"=,5E4 0*8 =""+,2%5,18 6\$" 3 *#" .6*2E +,24 6%78*+\$"6,8,("6& \$.1(O,%3 .

" 01, (2) 2#,H%1/" , " \$8\$("6+E%*4+:8 0*R\$(*8F8 \$#,8"+%,#,73.34 0*8 =""+,2%5,18 6\$" 3 *#" .6*2E +,24 6%78*+\$"6,8,("6& \$.1(O,%3 .

" 01, (2) 2#,H%1/" , " \$8\$("6+E%*4+:8 0*R\$(*8F8 *#\$(O,+*%7M,2.\$4 =""+,2%57\$4 0*8 =""+,2%5,18 6\$" 3 *#" .6*2E +,24 6%78*+\$"6,8,("6& \$.1(O,%3 .

I%*"4 (3) \$#< +"4+D..*%"4 (4) *56\$+*.+3(D8*4 2#,H%1/"*4 \$8+=7*4\$8\$626=,O,%7\$4
\$8&("6+,2 25%,1 0*8 =""+,2%5,18 6\$" 3 *#" .6*2E +,24 6%78*+\$"6,8,("6& \$.1(O,%3 . P (7\$
(1) 2#,H%1/"\$ \$8+=7\$8\$626=,O,%7\$4\$8&("6+,2 25%,1 #,2 *78\$".* =""+,2%57\$4\$%,2."&M"
(*):(D83 \$#<0,.3 6\$"/%EM*\$8+"6\$+&.+\$.34

" .:=38F.*"4 0"\$8,(E4 +,2 \$D%\$.+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1
#\$\$,2."&M,28 *6+*+\$(D83 0"&H%:.3 6\$" , " 0"6=*70*4%1>(.34 0*8 =""+,2%5,18 =<5:
0"&H%:.34.

" 0"\$/2+D4U"=E4O2.\$=70\$4 *=\$.+ "6E4 (* (H%&834 .+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1 , #\$\$%,2."&M,28 *6+*+\$(D8*4 0"\$%%,D4\$D%,\$ (* \$#,+D=*.(\$ +38 \$1R3.3 +34 6\$+\$8&=:34 *8D%5*\$#\$#< +,24 O2.3+E%*4\$*%".(,1 .

G<5: +:8 *6+*+\$(D8:8 0"\$%%,F8 \$D%\$#\$#< +,24 0"\$/2+D4 .+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1 6\$" +34 \$2R3(D834 =*"+,2%57\$4+:8 O2.3+E%:8, ," O2.3+E%*4 #\$\$%,2."&M,28.2/8D4 H=&H*4

P %1>("3 +34=*"+,2%57\$4:8 O2.3+E%:8 578*+\$(* /%,8"6E %1>("3.

<"c 9"7* % d,e*)

P 0*R\$(*8E 0*2+*%,H&>("\$4D/*" *.:+*%"6E 0"&(*+%, 17,0 m 6\$" (D., H&>,24 25%,1 .+, .3(*7, 2#*%/*7=".342.7 m.

I\$ *.%<(*8\$ =1(\$+\$ \$#\$< +,8 0"\$8,(D\$ %,E4 +%,O,0,+,18+\$" .+, 6D8+%,+34 0*R\$(*8E4(* \$5:5< 0"(D+%,2N280 +,#,>*+3(D8, *.:+*%"6& 6\$",(\$R,8"6& +346*8+%"6E4 6,=F8\$4 +34 0*R\$(*8E4 P 6,=F8\$.+, #&8: (D%,4 +34 6\$" .* H&>,4 0.5 m 6&+: \$#\$< +38 .+&>(3 +,2 25%,1 .+38 0*R\$(*8E OD%*#*%")(*+%"6&D..*%\$ \$8,75(\$+\$ 0"(D+%,2N 200 5"\$+38,(,"<(%O3 *7.,0, +:8 =2(&+:8 .+38 0*R\$(*8E. (,6*8+%"6& +346,=F8\$4 *.<0,2 2#&%/*" D8\$ 62="80%"6-0"&O%\$5(\$0\$(D+%,22,0 m 6\$" (E6,24 2,5 m, +, #,7, *78\$ " \$8\$%+3(D8, .+38 6*8+%"6E,=F8\$. I, 0"&O%\$5(\$2+< .28+*=*7 F.+* 3 +\$/1+3+\$ +:8 *.%)/(D8:8 =2(&+:8 8\$ (*"F8*+\$" .3(\$8+"6& 6\$" 8\$ (38 03("2%5,18+\$" .28>E6*4 \$8\$+&%\$R36\$+&+38*7.,0, +:8 =2(&+:8 .

l, 0"\$25D4 25%< 2#*%/*"=7M**#*%("(*+%6&+34 0*R\$(*8E4 (D.: ,0,8+:+,1
2#*%/*"=".+E.* 6\$8&="2==,5E4 6\$+\$.6*2\$.(D8, (* *=\$O%86=7.3 F.+* 8\$.256*8+%F8*"
+, 2#*%/*"=7M,25%<* O%*&+,*R:+%6&+340*R\$(*8E4

#2>(D8\$4 +34 0*R\$(*8E4 *78\$0"\$(\$,%O:(D8,4 (* 6=7.3 F.+* 8\$ 0"*26,=18*" +38
(*+\$O,%& +34 6\$>"M&8,2.\$4=&.#34 #%,4 +38 6*8+%6E,&83 .2==,5E4. K#< +38 /,&83
.2==,5E4 3 =&.#3 \$5*+\$(* .:=E8\$.

.\$%:+ "6<4 (3/\$8".(<4 \$#,+*=*7+\$#\$< \$6+"8"6E5DO2%\$* 0"&0%,(, #%<.H\$.34
6\$"#%,.+ \$+*2+"6&6"56="0F(\$+\$6\$ RD.+%,.2==,5E4 =&.#34.

P 5DO2%\$*0%&M*+\$.+38 6*8+%6E6,=F8\$ +34 0*R\$(*8E4 #&8: . * .1.+3(\$
D8.O\$"%:8 +% "HD:86\$ " #*% ".+%DO*+ \$#&8: . * 01, *=\$.+ "6,14 +%,/,14 +, #,>*+3(D8,24
*6\$+D%:>*8.+ , &==, &6%,+34 5DO2%\$4 " +%,/,7 6"8,18+\$ "#&8: .+, #*% "(+% "6<,"/*7,
(* \$#' *2>*7\$4(*+&0,.3 6783.34(D.: 3=*6+%,(*: +E%\$ P 5%\$(("6E+\$ /1+3+\$ +34 5DO2%\$4
.+38 #*% "OD%* 6\$ 2#% H\$78*# \$1.8m/min.

G*#70*4\$#<R*.34 (RD.+%)\$+,2 #2>(D8\$ \$8\$%+3(D8,(* +3=*6,#"6D4 %&H0,24\$#<
+38 5DO2%\$035,18 +38=&.#3 #%,4+, 6*8+%6O%*&+,".

A*% "(+% "6&+34 0*R\$(*8E4 6\$ " .: +*% "6& +,2 6\$8\$=",1 2#*%/*7="34 *78\$"
+, #,>*+3(D8,4 %2>("M<(*8,4 ,0,8+:+<4 2#*%/*"=".+E4 6\$ " O%&5(\$.256%&+3.34
#"#=*<8+:8, F.+* +\$ *#"#=D,8+\$8\$ (38 #\$\$\$\$.1%,8+\$#\$< +, 2#*%/*"=7M,25%<

S#7.34 2#&%/*" *#"O\$8*\$6E=*#70\$ \$#<R*.34 %2>("M<(*8,2 1U,24, #,2 #\$\$\$\$.1%*"
+\$ *#"#=D,8+\$ #%,4 +38 #*% "OD%* 6\$ " .+38 .28D/*"\$, (D.: *"0"6,1 (3/\$8".(,1 +\$:>*7
*8+<4 +34 /,&834 .2==,5E4. K#< +38 /,&83 .2==,5E4 +\$ *#"#=D,8+\$ \$#,\$(6%18,8+\$ " . *
\$8+=",.+&.", *#"#*=*<8+:8 \$#' <#,\$2 \$#,\$(6%18,8+\$ " #*%",0"6&.+38 0*R\$(*8E #&/28.34
=&.#34.

;EIFGM@VIQ?FAXF?XW

P \$6+"8"6E5DO2%\$(* +, RD.+%,.2==,5E4 =&.#34 6\$ " +38 *#"O\$8*\$6E=*#70\$
\$#<R*.34 #\$\$,2."&M**6+*+\$(D830"&H%:.3.

P \$8\$%+3(D83#"O\$8*" \$6E= *#70\$ \$#<R*.34 0*8 =*" +,2%5*76\$8,#,"3+"6& 6\$>F4 0*8
 *78\$"028\$+E3 %1>(" .3 +,2 1U,24, 6\$" 0*8 #\$\$\$\$.1%*" "6\$8,#,"3+"6&+\$ *#"#=D,8+\$#%,4 +3
 /,&83 .2==,5E4.

#*%"(*+% "6&,#,>*+3(D8,4 ,0,8+:+<4 2#*%/*"=" .+E40*8 *78\$"+,#,>*+3(D8,4 .
 8"\$7, 1U,4, (\$#,+D=*.(\$ +, 0"\$25\$(D8, 25%<8\$ (38 2#*%/*"=7M*(,"<(%O\$. * <=3
 +38 #*%7(*+%, +,2 6\$8\$=" ,1 2#*%/*7=" .34 I, (*):(D8, (E6,4 2#*%/*7=" .34 +,2

0"\$25\$. (D8,2 25%,1 D/" :4 \$#,+D=*. (\$ +38 \$1R3.3 +34 +\$/1+3+\$4 2#*%/*7=".346\$" +38
 .2(#\$%&.2%.3 \$"%,1(*8:8 .+*%*F8 .+38 DR,0,.
 P /,&83 .2==,5E4 +:8 *"#=#*<8+:8 /%EM*\$8+"6\$+&.+\$.34 6\$>F4 0*8 .2==D5*"
 "6\$8,#,"3+"6&+\$ *"#=#=D,8+\$

P 2#,H%1/"\$ \$8+=7\$\$#,(&6%28.34 +:8 *"#=#*<8+:8 #%,4 +3 0*R\$(*8E #&/28.34
 =&.#34 0*8 ="",2%5*7

\$5;.9 7)*

P 2#*%/*"=7M,2.\$*6%,E \$#< +3 0*R\$(*8E 6\$>7M3.34,035*7+\$".+, 6\$8&="*R<0,2,
 <#,2 #%\$5(\$+,#,"*7+\$" \$#,,=1(\$8.3 (* #%,.>E63 0"\$=1(\$+,4 NaOCl, (D.: 0,."(*+%"6E4
 \$8+=7\$4

B\$+<#"8 ,035*7+\$" #%,4 +*="6E 0"&>*.3, (D.: H\$%2+"6,1\$5:5,1 , .+3 >\$=&.." \$
 #*%"/,E +:8 b. ?,20\$8"F8 .

7';,5)'),5 ;)\$*)

P =&.#3 #,2 .256*8+%F8*+"\$.+,8 #2>(D8\$ +34 0*R\$(*8E4 6\$>7M3.34035*7+ "\$\$#<
+, RD.+,%,.+38 /,&83 .2==,5E4 .+, 6D8+%,+34 0*R\$(*8E4 6\$ " \$\$#< *6*7 (D.: \$5:5,1
H\$%1+3+\$40"\$(D+%,2 N 280 mm, 6\$+\$=E5*".\$+, \$8+=",.+&.", *#\$8\$626=,O,%7\$4 6\$"
\$#,&6%28.34 #*%7.."#\$4 =&.#34.

;+, \$8+=",.+&.", *78\$"+,#,>*+3(D8*4 01, (2) 2#,H%1/"*4 \$8+=7*4=2(&+:8 (3 (7\$
*O*0%"6E #,2 *R\$.O\$=7M,28\$8\$626=,O,%7\$7.3 (* +, 100% +34 (D.34 #\$\$, /E4 6\$>F4 6\$"
2 2#,H%1/"*4 \$8+=7*4=2(&+:8 (3 (7\$ *O*0%"6E 5"\$ +38 \$#,&6%28.3 +34 #*%7.."#\$4
=&.#34.

;EIFGM@VIQ`Q?FAXF?XW

*, * =*"+,2%57\$78\$\$(7\$ (1) \$\$#< +"401, (2) 2#,H%1/"*4 \$8+=7*4\$8\$626=,O,%7\$4=1,4.
P 0*1+*%3\$8+=7\$0*8 =*"+,2%5*6\$"3 *#".6*2E +346%78*+"\$6,8,("6& \$.1(O,%3 .

" 01, (2) 2#,H%1/"*4 \$8+=7*4=2(&+:8 5"\$ +38 \$#,&6%28.3 +34 #*%7.."#\$4 =&.#34
0*8 =*"+,2%5,18 6\$" 3 *#".6*2E +34 6%78*+"\$,"6,8,("6& \$.1(O,%3 . P #*%",0"6E
\$#,&6%28.3 #*%7.."#\$4 "=1,4 #%\$5(\$+,#,"*7+\$"(* +3 =*"+,2%57\$+34 2#,H%1/"\$4 \$8+=7\$4
\$8\$626=,O,%7\$4 "=1,4 6\$" 6\$+&==3=, /"%".(< 0"6=*70:8 .+,8 6\$+\$>="#+ "6<\$5:5<
\$8\$626=,O,%7\$4=1,4 6\$".+,8 \$5:5< .180*.34 (* +,8 6\$+\$>="#+ "6\$5:5< \$#,&6%28.34
#*%7.."#\$4 "=1,4.

\$ 1.7)* - \.<'>)*

B\$+&0"\$\$.+E(\$+\$ 3 *8*%5<4"=14#,2 #*=,8&M*",035*7+\$"(* +3 H,E>*" \$ \$8+= "F8.+3
0*R\$(*8E #&/28.34 , (* 0"\$\$.+&.*"4 3.50 m x 3.50 m 6\$" H&>,4 3.00 m, 5"\$ #&/28.3 (D/%"
5%.

I\$.+%%\$5570"\$#\$< +3 0*R\$(*8E #&/28.34 *#".+%DO,28(D.: H\$%1+3+\$#38 *7.,0,
+34 H",=,5"6E4*#*R*%5\$.7\$4?*+& +38 #&/28.3 +34=&.#34 3 =&.#3 \$O20\$+F8*+"(* +38
H\$%1+3+\$* .1.+3(\$ R3%\$8+"6F8="8F8

" R3%\$8+"6D478*4OD%,28D8\$*#"O8*\$6<.+%F(\$ 10-20 cm \$#\$< U"=E&((, (D:
0.3-0.75 mm) 6\$"2#<.+%:(\$ \$#\$< /\$=76"\$#&/,24 20 cm 6\$"0"\$(*+%E(\$+,4 15-25 mm.
P #%,4 \$O20&+.:3 =&.#3 0"\$8D(*+\$".+"4 R3%\$8+"6D478*4 .28,="6E4 *#"O&8*\$41.200
m2, (D.: 6\$+&==3=,2.2.+E(\$+,4 H\$8F8 6\$" .:=38F.*:8 .

I\$.+*%*& #\$\$\$\$(D8,28.+38 *#"O&8*\$<# ,2 .+*58F8,28 (* +3 H,E>*" \$ +,2 E=" ,2 6\$"
+,2 \$D%\$*8F +\$ 25%&0"D%/ ,8+\$"(D.\$ \$#\$< +\$ 0"3>3+"6&.+%F(\$+\$ +34 &((,2 6\$" +:8
/\$="6"F8 6\$" 6\$+=\$=E5,28.* O%*&+",.2==,5E4, \$#' <# ,2 (D.: \$8+= "F8 *#".+%DO,28.+38
7.,0, +34 H",=,5"6E4#*R*%5\$.7\$4

P \$O20\$+: (D83 =&.#3 \$#,\$(6%18*+\$" #*% ",0"6& (* /*"%:8\$6+"6D4 (*><0,24
(\$#<R*.3) 6\$",035*7+\$"#%,4 +*="6E0"&>*.3.

2.2 * / 9 "^GNYIXC_L.TIXFACEOWL"";

?* H&.3 +38 6\$+\$5%\$O#2 D/*" 578*", P/? *R,#=".(<4 +342O".+&(*834 SSG*(O\$87M*+ \$"
 .+,8 #78\$6\$#2 \$6=,2>*7:

/ " \$&')*+--"-.0+-13"\$5 - \$.\$.*.5\$75 ".835+75

/	%><, %5) "c5\$;,)9 5.	\$"3,03 *	.)' *9	% ')% ".)'*)	'.\$5)	,)1.) kW	TAXYT. rpm
1	C1	K2+,6\$>\$%"M<(*8, N7=+%,	S./&%:.3	?P_Kb]BP ASg]dKGG bl ;	RTOSIEVE ER-120, D=628mm,L=1200mm V"&6*8,=1mm	0,75	9
2	C2	B,/=7\$4 ;2(#7*.34	S./&%:.3	SPIRAC	U-250/SP215, D=215mm	1,5	22
3	C4	N2.3+E%\$4	K((,.2==, 5E	EFFERIZETA	FPZ SCL 40DH, Q=73Nm3/h, P=300mbar, DN50	2,2	2900
4	C5	N2.3+E%\$4	K((,.2==, 5E	EFFERIZETA	FPZ SCL 40DH, Q=73Nm3/h, P=300mbar, DN50	2,2	2900
5	C6	N2.3+E%\$4	K((,.2==, 5E	EFFERIZETA	FPZ SCL 40DH, Q=73Nm3/h,P=300mb ar, DN50	2,2	2900
6	C7	V"\$/:% ".+E4 &((,2	K((,.2==, 5E	?P_Kb]BP ASg]dKGG bl ;	SR260,D=280mm	0,37	4,8
7	C8	K8\$("6+E%\$4	d",*#"=,5E	Flygt	SR 4610, Impeller D=210mm	0,75	1390
8	C9	K8\$("6+E%\$4	d",*#"=,5E	Flygt	SR 4610, Impeller D=210mm	0,75	1390
9	C10	K8\$("6+E%\$4	K#,8"+% ,#, 73.3	Flygt	SR 4630, Impeller D=370mm	1,5	705
10	C11	K8\$("6+E%\$4	K#,8"+% ,#, 73.3	Flygt	SR 4630, Impeller D=370mm	1,5	705
11	C12	K8\$("6+E%\$4	S#\$ (O,+*%7 M,2.\$	Flygt	SR 4630, Impeller D=370mm	1,5	705

/	%><,%5) "c5\$;,)9 5.	\$"3,03 *	.)')*9	% ')%".)'*)	'. \$5)	,)1.) kW	TAXYT. rpm
12	C13	K8\$("6+E%\$4	S#\$(O,+*%7 M,2.\$	Flygt	SR 4630, Impeller D=370mm	1,5	705
13	C14	N2.3+E%\$4	b"+%,#,73. 34	ROBUSCHI	S75/3P,Q=1174Nm3/h ,P=450mbar,DN150	30	2945
14	C17	N2.3+E%\$4	b"+%,#,73. 34	ROBUSCHI	S75/3P,Q=1174Nm3/h ,P=450mbar,DN150	30	2945
15	C20	K8+=7\$	K8&("6+, k5%<	Flygt	NP3102.180 LT/420,Q=204m3/h, H=4m, DN150	3,1	1435
16	C21	K8+=7\$	K8&("6+, k5%<	Flygt	NP3102.180 LT/420,Q=204m3/h, H=4m, DN150	3,1	1435
17	C22	K8+=7\$	K8&("6+, k5%<	Flygt	NP3102.180 LT/420,Q=204m3/h,H =4m, DN150	3,1	1435
18	C23	K8+=7\$	K8&("6+, k5%<	Flygt	NP3102.180 LT/420,Q=204m3/h,H =4m, DN150	3,1	1435
19	C24	aD.+%, B\$>7M3.34	d' 6\$>7M3.3	BONFIGNIOLI		0,25	4,4
20	C25	K8+=7\$	K8\$626=,O ,%7\$ G&.#34	Flygt	NP3085.182MT,Q=78 m3/h, H=4m,DN80	1,3	1450
21	C26	K8+=7\$	K8\$626=,O ,%7\$ G&.#34	Flygt	NP3085.182MT,Q=78 m3/h, H=4m,DN80	1,3	1450
22	C27	K8+=7\$	S#"#=D,8+\$	Flygt	DP3045 MT/234,Q=16,5m3/h, H=4m,DN50	0,8	2870
23	C28	K8+=7\$	S#"#=D,8+\$	Flygt	DP3045 MT/234,Q=16,5m3/h, H=4m,DN50	0,8	2870
24	C29	K8+=7\$	A&/28.3 G&.#34	Flygt	DP3045 MT/234,Q=16,5m3/h, H=4m,DN50	0,8	2870
25	C30	K8+=7\$	A&/28.3 G&.#34	Flygt	DP3045 MT/234,Q=16,5m3/h, H=4m,DN50	0,8	2870

/	%><,%5) "c5\$;,)9 5.	\$"3,03 *	.)'9	% ')%".)'*)	'.5\$)	,)1.) kW	TAXYT. rpm
26	C31	K8+=7\$ k#*%/*"=".(&+:8	A&/28.3 G&.#34	Cigni	PN 21M,Q=16m3/h, H=5m,DN50		
27	C32	K8+=7\$+%%\$55"07:8	a3%\$8+"6D4 B=78*4	Cigni	PN 21M,Q=16m3/h, H=5m,DN50		
28	C35	K8+=7\$	V,."(*+%6E N,%("6,1 RD,4	Allidos	M208-5, Q=5lt/h,P=10bar	0,09	
29	C36	K8+=7\$	S./&%:.3	Cigni	PN 21M,Q=16m3/h, H=5m,DN50		
30	C39	K8+=7\$&((,2	K((,.2==, 5E	Caprari	MAV 07T4, Q=15m3/h,H=4m,DN5 0	0,7	
31	C40	K8+=7\$&((,2	K((,.2==, 5E	Caprari	MAV 07T4, Q=15m3/h,H=4m,DN5 0	0,7	

3. "c5\$;,)95) \$35) 7',% ')') * / 7 a d9,)*

Z"\$ + "4\$8&56*4*6.25/%,8".(,1 +34 2O".+&(*834 SSG >\$ /%*"\$.+*7 (D%,4 +,2 *R,#=".(,1
8\$ \$8+"6\$+\$.+>*7 (D%,4 8\$ \$8\$H\$>(".*7 6\$" +D=,4 8\$ +,#,>+3>*7 *#"%<.>+*,4
*R,#=".(4 .

\3" ',5 ",)5<5. - ")1 3>)*

I, .18,=, +,2 2O".+&(*8,2 *R,#=".(,1 +34(,8&0\$4 S./&%:.34 >\$ \$8+"6\$+\$.+>*7
#=E%:4 S"0"6<+*%\$

I, 2O".+&(*8, #*%".+%*O<(*8, +1(#\$8, *./&%:.34 >\$ \$8+"6\$+\$.+>*7(* D8\$8D,
+1(#\$8, 6\$" *#"#=D,8 >\$ +,#,>+3>*7 #\$\$\$&#*=2%\$6\$" D8\$ *#"#=D,8 #*%".+%*O<(*8,
+1(#\$8, .

2O".+&(*8,4 6,/=7\$4 (*+\$O,%&4 6\$" .2(#7*.34 *./\$%".(&+:8 >\$ \$8+"6\$+\$.+>*7
(* D8\$8D,, .+,8 ,#7, >\$ 6\$+\$.=E5,28+\$ *./\$%7.(\$+\$ 6\$" \$#< +\$ 01, 8D\$#*%".+%*O<(*8\$
+1(#\$8\$ *./&%:.34 .

995).;;50* - ;,\$5).;;50*

I, .18,=, +,2 2O".+&(*8,2 *R,#=".(,1 +34(,8&0\$4 K((,.2==,5E4 - G"#,.2==,5E4
>\$ \$8+"6\$+\$.+>*7#=E%:4 S"0"6<+*%\$

m\$ +,#,>+3>*7 8D\$5DO2%,#\$="80%,"6E46783.34 6,"8E 6\$" 5"\$+"401, 0*R\$(*8D4
\$((,.2==,5E4 - ="#,2==,5E4, .+38 ,#7\$ >\$ *78\$"\$8\$%+3(D8\$+\$ 01, RD.+%\$#\$"O\$8*7\$4
.&%:.34 +:8 *#"#=<8+:8 ="#F8 6\$" *=7:8 .+,8 /F%, *#7#*=2.34 6\$" ," 01, 2#,H%1/"*4
\$8+=7*4"\$+38 &8+=3.3 +34.2==*5<(*834 .+,8 #2>(D8\$+:8 \$((,.2==*6+F8 &((,2 .

m\$ +,#,>+3>,18 01, (2) 8D*4 2#,H%1/"*4 \$8+=7*4 5"\$ +38 &8+=3.3 +34
.2==*5<(*834 .+,8 #2>(D8\$+:8 \$((,.2==*6+F8 &((,2 , (* #+*%:+E +1#,2 Vortex, F.+*
8\$ (38 O>*7%*+\$#\$< +38 &((, . B&>* \$8+=7\$>\$ 0"\$>D+*H&.3 (pedestal) (* \$2+<(\$+,
.1.+3(\$ \$8D=62.34 - 6\$>D=62.34 \$8,R*70:+, \$5:5< 6\$+&=>"U34 0"6=*70\$#\$,(<8:.34
=\$+."6E4D(O%\$R36\$H\$=H70\$8+#".+%,OE4=2(&+:8 .

Z"\$ +,8 \$*%".(< +:8 0*R\$(*8F8 \$((,.2==,5E4 >\$ +,#,>+3>*7 076+2,\$8,R*70+:8
.:38F.*:8 6\$" 0"\$2+F8 (*.\$7\$4 O2.\$=70\$4 6\$+&(E6,4 6&>* 0*R\$(*8E4

P #\$/E \$D%\$+, .1.+3(\$ 0"&/2.34 >\$ #\$/D/*+\$#\$< +%*"43) (2 61%",24+ 1
*O*0%"6\$ 8D,24 O2.3+E%*4 +%F8 #*%".+%*O<(*8:8 =,HF8. " O2.3+E%*4 >\$ *78\$"
+,#,>+3(D8," . * 3/,(8:+"6,14 6=:H,14 .

B&>* O2.3+E%\$4>\$ (#,%*7 8\$ +%,O,0,+E.*" ,#,"\$0E#,+* 0*R\$(*8E \$((,.2==,5E4 (D.: .180*.34 <=:8 +:8 O2.3+E%:8 (6\$" +,2 *O*0%"6,1) .* 6,"8< .2==D6+3- \$5:5< 6\$" +%,O,0,.7\$ 6&>* 0*R\$(*8E4 \$((,.2==,5E4 (* R*/:~".+< \$5:5< +%,O,0,.7\$4 \$D%\$ D=*5/,4 ="",+2%57\$4:8 O2.3+E%:8 >\$ 578*+\$(D.: +,2 6*8+%"6,1.2.+E(\$+,4 *=D5/,2 6\$" *8\$==6\$+"6&(* /%,8,#%<5%\$(((\$, *8F >\$ D/,28, *#7.34, 626="6E*8\$==5E="",+2%57\$4 5"\$,\$("(<,%O3 O>,%&

I, (75(\$ =2(&+:8 - &((,2 >\$,035*7+\$".* 8D, .256%<+3(\$ #=1.34 - 0"\$/:~".(,1 &((,2 (sand classifier), Z"\$ 6\$=1+*%3="",+2%57\$6\$" (*5\$=1+*%3 \$#,+,%&55".3 , 6,/=7\$4 *78\$""0"6,1 +1#,2 /:~74 &R,8\$ P /\$(3=E +\$/1+3+\$ #*%".+%,OE4+,2 *R\$.O\$=7M*+38 \$#<=2+3\$#,2.7\$ \$8\$+\$%&R*:8

P 3=*6+%,=,5"6E*56\$+&.+\$.3 +34(,8&0\$4 , 6\$=:0"F.*"4 6\$" 3=*6+%"6<#78\$6\$46\$" , \$2+,(\$+").(<4 ="",+2%57\$4\$ \$8\$+"6\$+\$.+>.,18 #=E%:4

a,5;50,%* "\$c"30),

*R,#=".(<4 +:8 0*R\$(*8F8 H",=,5"6E4 *#*R%5\$.7\$4>\$ \$8\$+"6\$+\$.+>*7#=E%:4 S"0"6<+*%\$

m\$ +,#,>*+3>,18 01, (2) 8D," 2#,H%1/" , "\$8\$("6+E%*4+:8 0*R\$(*8F8 H",*#=",5E4 01, (2) 8D," 2#,H%1/" , "\$8\$("6+E%*4+:8 0*R\$(*8F8 \$#,8"+%,#,73.34 6\$" 01, (2) 8D," 2#,H%1/" , "\$8\$("6+E%*4+:8 0*R\$(*8F8 *#\$(O,+*%7M,2.\$4="",+2%57\$4n=", " "\$8\$("6+E%*4 >\$ *78\$".15/%,834 +*/8,=,57\$4 (* *8.:(\$+: (D8, inverter.

m\$ +,#,>*+3>,18 +D..%"4 (4) 8D*42#,H%1/"*4 \$8+=7*4\$8\$626=,O,%7\$4\$8&("6+,2 25%,1. B&>* \$8+=7\$>\$ 0"\$>D+*"H&.3 (pedestal) (* \$2+<(\$+, .1.+3(\$ \$8D=62.34 - 6\$>D=62.34 \$8,R*70+:,24 \$5:5,14 6\$+&=>"U340"6=*70\$#\$,(<8.:34 *=\$.+"6E4 D(O%\$R34 6\$" H\$=H70\$8+*#".+%,OE4=2(&+:8 . n=", " "\$8+=7*4\$8\$626=,O,%7\$4\$8&("6+,2 25%,1 >\$ *78\$".15/%,834 +*/8,=,57\$4 (* *8.:(\$+: (D8, inverter.

" .:=38F.*"4 0"\$8,(E4 +,2 \$D%\$.+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1 , , " 0"6=*70*4%1>(".34 6\$" , " 0"\$2+D4U"=E4O2.\$=70\$4 *=\$.+"6E4 (* (H%&834 .+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1 , >\$ \$8\$+"6\$+\$.+>.,18 #=E%:4

P #%\$,/E \$D%\$+, .1.+3(\$ 0"&/2.34 >\$ #%\$D/*+\$#\$< +*%"43) (2 61%",24+ 1 *O*0%"6)* 8D,24 O2.3+E%*4 +%"F8 #*%".+*%O<(*8:8 =,HF8. " O2.3+E%*4 >\$ *78\$"+, #,>*+3(D8," .* 3/,(8:+"6,14 6=:H,14 .

B&>* O2.3+E%\$4>\$ (#,%*7 8\$ +%,O,0,+E.*" ,#,"\$0E#,+* 0*R\$(*8E \$*%".(,1 (D.: .180*.34 <=:8 +:8 O2.3+E%:8 (6\$" +,2 *O*0%"6,1) .* 6,"8< .2==D6+3- \$5:5< 6\$" +%,O,0,.7\$ 6&>* 0*R\$(*8E4 \$*%".(,1 (* R*/:~".+< \$5:5< +%,O,0,.7\$4 \$D%\$

D=*5/4 ="*,2%57\$4:8 O2.3+E%:8 >\$ 578*+\$(D.: +,2 6*8+% "6,1.2.+E(\$+,4
*=D5/2, *8F >\$ D/,28, *#7.34, 626="6E*8\$==5\$E="*,2%57\$5"\$,(<,(%O3 O>,%&

P \$8\$=,5"6E %1>("3 +34 ="*,2%57\$4:8 O2.3+E%:8 >\$ 578*+\$(2+<(\$+\$, (D.:
(*+%3+F8 0"\$=2(D8,2 ,R25<8,2. ;* 6&>* 0*R\$(*8E \$*%".(,1 >\$ +,#,>*+3>*7 D8\$4(*+%3+E4
0"\$=2(D8,2 ,R25<8,2 on – line, , ,#,7,4 >\$.+D=8" \$8\$=,5"6< .E(\$ 4-20 mA .
(*+\$+%,#D\$.2/8<+3+\$4 5"\$ +38 .28*/E \$2R,(7:3 +:8 .+%,OF8 6&>* O2.3+E%\$ (*
.6,#< +38 0"\$+E%3.3+34.256D8+%:.34 +,2 0"\$=2(D8,2 ,R25<8,2 .+"4 0*R\$(*8D4\$*%".(,1
.+38 +"(E +:8 2.0 mg/lit. m\$ +,#,>*+3>,18 +%*"43) 8D,"(*+\$+%,#74.2/8<+3+\$4.

;* 6&>* 0*R\$(*8E \$*%".(,1 >\$ +,#,>*+3>*7 D8\$4(*+%3+E4.256D8+%:.34 .+*%F8
(MLSS) on – line.

;+, O%*&+", 0"\$8,(E4 %,E4 #%,4 +3 0*R\$(*8E 6\$>7M3.34>\$ #%\$5(\$+,#,"*7+\$"
#%,>E63 0"\$=1(\$+,4 Fe, (D.: 0,."(*+% "6F8 \$8+="F8 (1 61%"\$+ 1 *O*0%"6E 5"\$ +3
0D.(2.3 6\$" #,(&6%28.3 +,2 N:O<%,2 6\$"+3 0%\$.+"6E6\$+\$#,D(3.3 +,2 O"\$8,(D8,2
+34*#"#=D,2.\$4 =&.#34 .+3 0*R\$(*8E 6\$>7M3.34

P 3=*6+%,=,5"6E*56\$+&+\$.3 +34 (,8&0\$4 , 6\$=:0"F.*"4 6=#. >\$ \$8+"6\$+\$.+>.,18
#=E%:4

<"c 9"7* % d,e*)*)

*R,#=".(<4 +340*R\$(*8E46\$>7M3.34\$ \$8+"6\$+\$.+>*7#=E%:4 S"0"6<+*%\$
(,6*8+% "6& +34 6,=F8\$4 *".<0,2 >\$ +,#,>*+3>*7 8D, 62="80%"6<0"&O%\$5(\$ \$#<
\$8,R*70:+, /&=2H\$, \$8\$%+3(D8,+.38 6*8+% "6E,=F8\$, F.+* 3 +\$/1+3+\$+8 *".%/, (D8:8
=2(&+:8 8\$ ("F8*+\$" .3(\$8+"6& 6\$" 8\$ (38 03("2%5,18+\$" .28>E6*4 \$8\$+&%\$R38\$+&+38
*7.,0, +:8 =2(&+:8 .

m\$ +,#,>*+3>*7 8D\$ #*%".+%*O<(*83\$6+"8"6E5DO2%\$* #=\$7.", \$#< \$8,R*70:+,
/&=2H\$. P .2==,5E +34 "=1,4 \$#< +,8 #2>(D8\$ +34 626="6E40*R\$(*8E46\$>7M3.34#%,4 +,8
6F8, "=1,4 >\$ 578*+\$(\$#< .\$.%:+E, , ,#,7,4 >\$ OD%*+\$ \$#< #*%".+%*O<(*835DO2%\$D.:
\$%>+:F8 .280D.(8 6\$" >\$ 62=& .+8 #2>(D8\$ +34 0*R\$(*8E4 #&8: .* +%,/,14 \$#<
teflon E &==, 6\$+&==3=,2="6< F.+* 8\$ #\$\$\$6,=,2>*7 +4("6%D4\$8:(=\$7*4 +,2 #2>(D8\$
+34 0*R\$(*8E4 " =*#70*4.&%:.34 >\$ #D#*8\$ D/,28 *#%6E\$==3=,*#"6&=2U3 6\$" 8\$
0"\$(,%OF8,28 =,5\$%>("6ED="6\$

A*%="(\$H&8*+\$3 \$8+"6\$+&+\$.3 +,2 3=*6+%,=,5"6,1 #78\$6\$+345DO2%\$46\$>F4 6\$"
+:8 6\$=:0"F.*:8 \$#< +,8 +,#"6< #78\$6\$0"\$8,(E4 "/1,4 6\$" *=D5/2 (D/%" +, .+>*%<
.3(*7, 3=*6+%,=,5"6E4180*.34 +345DO2%\$4

A*%("(*+%6&340*R\$(*8E46\$".:.*%6& +,2 6\$8\$="1 2#*%/*7=".34>\$ +,#,>*+3>*7
8D,4 %2>("M<(*8,4 ,0,8+:+<4 2#*%/*"=".+E4 6\$ O%&5(\$.256%&+3.34 *#">#=*<8+:8 \$#<
\$8,R*70:+, /&=2H\$, F.+* +\$ *#">#=D,8+\$8\$ (38 #\$\$%.1%,8+\$#\$< +, 2#*%/*=7M,25%<

7';,5)' ,5 ;)\$*)

m\$ +,#,>*+3>,18 01, (2) 8D*4 2#,H%1/"*4 \$8+=7*4\$8\$626=,O,%7\$4"=1,4. B&>*
\$8+=7\$>\$ 0"\$>D+*"H&.3 (pedestal) (* \$2+<(\$+, .1.+3(\$ \$8D=62.34 – 6\$>D=62.34
\$8,R*70:+, \$5:5< 6\$+&>="U34 0"6=*70\$#\$,(<8:.34 *=\$+."6E4 D(O%\$R346\$ H\$=H70\$
\$8+*#".+%,OE4=2(&+:8 .

;+,8 6,"8< 6\$+\$>="#+"6\$5:5< +:8 \$8+=F8\$8\$626=,O,%7\$4"=1,4 >\$ +,#,>*+3>*7
3=*6+%,(\$583+"6<#\$%/,/<(*+%, .

m\$ +,#,>*+3>,18 01, (2) 8D*42#,H%1/"*4 \$8+=7*4\$#,&6%28.34 #*%7.."#\$4"=1,4.
B&>* \$8+=7\$>\$ 0"\$>D+*"H&.3 (pedestal) (* \$2+<(\$+, .1.+3(\$ \$8D=62.34 – 6\$>D=62.34
\$8,R*70:+, \$5:5< 6\$+&>="U34 0"6=*70\$#\$,(<8:.34 *=\$+."6E4 D(O%\$R346\$ H\$=H70\$
\$8+*#".+%,OE4=2(&+:8 .

;+,8 6,"8< 6\$+\$>="#+"6\$5:5< +:8 \$8+=F8\$#,&6%28.34 +34 #*%7.."#\$4 =&.#34
>\$ +,#,>*+3>*7 3=*6+%,(\$583+"6<#\$%/,/<(*+%, .

n=" , " \$8+=7*4+,2 \$8+=,.,+\$7,2 " =1,4 >\$ *78\$".15/%,834 +*/8,=,57\$4 (*
*8.:(\$+:D8, inverter.

\$ 1.7)* – \.<'>)*

;+3 0*R\$(*8E #&/28.34 =&.#34 >\$ +,#,>*+3>*7 D8\$4(1) 2#,H%1/"4 *5/2+E%\$4
\$D%\$5"\$+3.28*/E \$8&0*2.3 +340*R\$(*8E4

;+,8 #78\$6\$ #,2 \$6,=,2>*7 070*+\$" \$8\$=2+"6& , *R,#="(<4 #%,4
\$8+"6\$+&+\$.3/\$8\$H&>("3.

!#%'%) *, - /!)0-2 **/ 4-) %6!'6%)6%)8 /%#%:%<0!)8

3/3	)\$9+;930	\$&')*+-'	<=	)'-	>393- @1 9+-1+@3	'5" . +>.- (KW)	*\$+1'.9 . \$&')* .	)393 - 1 9 -\$+-
1	1&3839&	" \$&(*, . 0 1&357&839,0	::<.	2		0,80KW	2	
		" \$&(*, . 0 73"&*.373&,0,0	::<.	2		1,50KW	2	
		" \$&(*, . 0 57 \$=3*5.&>3@0 0	::<.	2		1,50KW	2	
		"*8 . " (@ (83=3.& 0 "&*.&(B"	::<.	4(2+2)	Q = 204m ³ /h, H = 4m	3,10KW	1	
		"*8 . " (@ (83=3.& 0 &8@30	::<.	2(1+1)	Q = 78m ³ /h, H = 4m	1,30KW	1	
		"*8 . 75.&005& &8@30 0@0*, \$ D& E@0,0	::<.	2(1+1) 1		0,80KW	- 1	7.30*&C5* &
2	(C&>,0,	95=@. , G50*.3 H I J .	::<.	1	L = 9m	0,25KW	1	
		"*8& 0*. 99&D&B"	::<.	2(1+1)	Q = 15m ³ /h, H = 4m	0,70KW	1	
3	(*&.& =@0*,,.B"	=@0*,,. 0	::<.	2	Q = 1174Nm ³ /h, 450mbar	30KW	2	
		=@0*,,. 0	::<.	1	Q = 1174Nm ³ /h, 450mbar	30KW	-	7.30*&C5* &
		D30&\$5*.& (, "*8 . FeCl ₃	::<.	2(1+1)	Q = 3,9lt/h	0,60KW	1	
4	\$5*.,*&(30 5G378&0\$30- @*3\$*&0\$3& (*)	3G@93"3\$5*.3	::<.	2			2	7.30*&C5* &
		0@9(5"*B0, 0*5.5B" (MLSS)	::<.	2			2	7.30*&C5* &
		\$5*.,*,0 7.3E,0 " (@ (83=3.& 0	::<.	2			2	7.30*&C5* &
		\$5*.,*,0 7.3E,0 8 07,0 7.30 =@D *B0,	::<.	1			1	7.30*&C5* &
5	7 E@*0,	59E@*,. 0 5.	::<.	1	Q = 155 Nm ³ /h	5,9(W	1	7.30*&C5* &
6	5.9 @73D3\$,0	,85(*.3839&(3& 7&" (50	::<.	1			1	
		(8BD&B05&0	::<.	1			1	

(*) (*+%3+"6<4*R,#=".(<4 6\$ " , " \$2+,(+\$".(,7 \$#,+*=,18 \$8+"6*7(*8, &==34
*8<+3+\$4+,2 D%5,2

4. "30 "\$"%')*) "";

4.1 9K]G[GL "NE^E@V?XU?L<MO?CIQ_FWF?

I\$ 8D\$ D%5\$#%,H=D#,28 0"#=\$.("\$(< 028\$("6<+3+\$4 \$#< 12.000 .* 24.000
",.018\$,(24 6\$+,76,24 (* \$#,+D=*.(\$ 5"\$=<5,24 HD=+ ".+34*" +,2%57\$6\$" .28+E%3.34 8\$
#%,+*78*+\$3 70"\$D>,0,4 **R*%5\$.7\$4* 0"#=\$.("\$(< +:8 2O".+&(*8:8 (,8&0:8 .

7K? g@V?

"NE^E@V?XU?MCAFSO

P 8D\$,(8&0\$ **R*%5\$.7\$4+:8 =2(&+:8 #*%")=\$(H&8*"
ÿ ?,8&0\$ H",=,5"6E4 **R*%5\$.7\$4 (H",*#",=,5E - \$#,8"+%,#,73.3 - 8"+%,#,73.3
\$8\$626=,O,%7\$8"+%"6F)8
ÿ V*R\$(*8E 6\$>7M3.346\$+&8+3+348D\$4,(8&0\$4 H",=,5"6E4**R*%5\$.7\$4
ÿ K8+=",.+&.", *#">#=<8+:8
ÿ N7=+%0"1=" .345"\$+38 *R2#3%D+3.32O".+&(*8:8 6\$" 8D:8 *56\$+\$.+&.*:8
ÿ V"&+\$R3 K#,=1(\$8.34 (* UV 5"\$ +38 *R2#3%D+3.3 2O".+&(*8:8 6\$" 8D:8
56\$+\$.+&.:8
ÿ V*R\$(*8E d", (3/\$8"6,1 8*%,1 5"\$ +38 *R2#3%D+3.3 2O".+&(*8:8 6\$" 8D:8
56\$+\$.+&.:8

"NE^E@V?XU?YhGL

P (,8&0\$ **R*%5\$.7\$4+34=&.#34 #*%")=\$(H&8*"
ÿ K8+=",.+&.", \$8\$626=,O,%7\$6\$" \$#,(86%28.34 #*%7.." \$4 "=1,4
ÿ V*R\$(*8E #&/28.34 6\$+&8+3+348D\$46\$>7M3.34
ÿ S56\$+&.+\$.3 ?3/\$8"6E4 \$O20&+:.34 "=1,4 5"\$+38 *R2#3%D+3.32O".+&(*8:8 6\$" 8D:8
56\$+\$.+&.:8

;GINKL "VQ?F?XFAXEIL

1. B+7%", *8D%5*" \$4(k#,.+\$>(<4 , P=*6+%,#\$\$%5:5< i*15,4 5"\$ +38 *R2#3%D+3.3
2O".+&(*8:8 6\$" 8D:8 *56\$+\$.+&.*:8)
2. S8"\$7,6\$" *6.25/%,8".(D8, ;1.+3(\$ K2+,\$+).(F8 5"\$,=<6=3%3+38 *56\$+&.+\$.3 (5"\$
+38 *R2#3%D+3.32O".+&(*8:8 6\$" 8D:8 *56\$+\$.+&.*:8)

3. S#D6+\$.3 +:8 D%5:8 2#,0,(E4 (*R:+"%"6<4O:+".(<4 , 076+2, H", (3/\$8"6,1 8*%,1, O2+*1."4 6=#)
4. S56\$+&.+\$.3 ;2.+E(\$+,4 K8+"6*%\$28"6E4%,+\$.7\$4 (* \$670\$",8".(,1 *#7".+,1
5. K8+=",.+&.", K-4 (K0*",0,+3(D8, (* +381681 04-04-2013 KSA)
6. I, O%*&+",O<%+" .34+,2 2#,>\$=&..",2 \$5:5,1 , +, ,#,7, /:%,>*+*7+\$" (*8 *8+<4+34 SSG\$==&\$#,+*=*7 \$8+"6*7(*8, &==34*8<+3+\$4

\3" ',5 ",)5<5. - ")1 3>)*

m\$ +, #,>*+3>*7 #*%".+%*O<(*8, +1(#\$8, #\$\$&#=#2%\$+, 2O".+&(*8, , +, ,#,7, *#7.34 >\$ \$8+"6\$+\$.+>*7* 8D,.

2O".+&(*8,4 6,/=7\$4 (*+\$O,%&4 6\$" .2(#7*.34 *./\$%".(&+:8 >\$ \$8+"6\$+\$.+>*7 (* D8\$8D,, .+,8 ,#,7, >\$ 6\$+\$.=E5,28+\$ *./%\$7.(\$+\$ 6\$" \$#< +\$ 01, 8D\$#*%".+%*O<(*8\$ +1(#\$8\$ *./&%:.34 .

995).;;50* - ;,\$5).;;50*

I, 2O".+&(*8, O%*&+", (*%".(,1 , .+38 DR,0, +34 (,8&0\$4 K((,.2==,5E4 - G"#,.2==,5E4, #*%")=\$(H&8**"6+<4 \$#< +,24 01, *8 ="",+2%57\$>\$=&,(24 6\$" D8\$8+%7+, *6+<4 ="",+2%57\$4K#< \$2+<8 +,8 >&=\$(, >\$ (,"%&M,8+\$"+\$ =1(\$+\$.+3 8D\$ 5%\$)((E H",=,57\$4 (D.: %2>("M<(*8,22#*%/"*="."+6,1 >2%,O%&5(\$+,4#,2 >\$ +, #,>*+3>*7.

a,5;50,%* "\$"c"30),

m\$ 6\$+\$.6*2\$.+*7 8D\$ 5%\$)((E d",=,5"6E4 *#*R*%5\$.7\$4 (* <("\$ ="",+2%5"6E 0"&+\$R36\$" 0"\$+&.*"4 0*R\$(*8F8 (* +38 2#&%/,2.\$ 6\$" >\$ #*%")=\$(H&8**"01, (2) 8D*4 5%\$)((D4*#*R*%5\$.7\$4<(",*4 (* +"42O".+&(*8*4. f6\$.+3 5%\$)((E H",=,5"6E4 *#*R*%5\$.7\$4 >\$ \$#,+*=*7+\$ "\$#< #D8+*0"\$0,/"6D4(cascade) 0*R\$(*8D4:

- V*R\$(*8E H",*#"=,5E4
- V*R\$(*8E \$#,8"+%,#,73.34
- V*R\$(*8E *#\$(O,+*%7M,2.\$4="",+2%57\$4
- V*R\$(*8E 8"+%,#,73.34(\$*%".(<4)
- V*R\$(*8E 8"+%,#,73.34(\$*%".(<4)

I, \$#\$"+,1(*8, 5"\$ +38 H",#\$,"6,0<(3.3 ,R25<8, 6\$>F4 6\$" 3 \$8\$56\$7\$"/.14 \$8&0*2.34 +:8 =2(&+:8 #\$\$%D/,8+\$ "\$#< .1.+3(\$ 2#,H%1/"\$40"&/2.34 .

I, .1.+3(\$ \$2+<\$#,+*=*7+\$ "\$#<:

- ;:=38F.*"4 6\$+\$8,(E4

- 1,24 \$#\$"+,1(*8,24 . * #=E>,4 0"\$/2+D4U"=E4O2.\$=70\$4 *=\$.+ "6E4 (* (H%&834
+,8 #2>(D8\$ +:8 0*R\$(*8F8 \$*%".(,1 .

P #\$\$,/E \$D%\$+, .1.+3(\$ 0"&/2.34 >\$ #\$\$D/*+\$ "\$#< +%*"43) (2 61%",24+ 1
*O*0%"6\$ 8D,24 O2.3+E%*4 +% "F8 #*%".+%*O<(*8:8 =,HF8. " O2.3+E%*4 >\$ *78\$"
+,#,>+3(D8," . * 3/,(8:+"6,14 6=:H,14 .

B&>* O2.3+E%\$4>\$ (#,%*7 8\$ +%,O,0,+E.*" ,#,"\$0E#,+* 0*R\$(*8E \$*%".(,1 (D.:
.180*.34 <=:8 +:8 O2.3+E%:8 (6\$" +,2 *O*0%"6,1) . * 6,"8< .2==D6+3 - \$5:5< 6\$"
+%,O,0,.7\$ 6&>* 0*R\$(*8E4\$*%".(,1 (* R*/:." +< \$5:5< +%,O,0,.7\$4 \$D%\$

D=*5/,4 =*"+,2%57\$4+:8 O2.3+E%:8 >\$ 578*+\$"(* /%,8"6E %1>("3, (D.: +,2
6*8+%"6,1.2.+E(\$+,4 *=D5/,2, *8F >\$ D/,28, *#7.34, 626="6E*8\$==5\$E =*"+,2%57\$4\$"
,(" <(%O3 O>,%&

S#7.34 3 %1>("3 +34 =*"+,2%57\$4+:8 O2.3+E%:8 >\$ 578*+\$"\$2+<(\$+\$, (D.:
(*+%3+F80"\$=2(D8,2 ,R25<8,2. ;* 6&>* 0*R\$(*8E \$*%".(,1 >\$ +, #,>+3>*7 D8\$4(*+%3+E4
0"\$=2(D8,2 ,R25<8,2 on - line, , #,7,4 >\$.+D=8*" \$8\$=,5"6< .E(\$ 4-20 mA . *
(*+\$+%,#D\$.2/8<+3+\$4 5"\$ +38 .28*/E \$2R,(7:3 +:8 .+%,OF8 6&>* O2.3+E%\$ (*
.6,#< +38 0"\$+E%3.3+34.256D8+%.:34 +,2 0"\$=2(D8,2 ,R25<8,2 .+"4 0*R\$(*8D4\$*%".(,1
+.38 +"(E +:8 2.0 mg/lit. m\$ +, #,>+3>,18 +%*"43) 8D," (*+\$+%,#*74.2/8<+3+\$4.

;* 6&>* 0*R\$(*8E \$*%".(,1 >\$ +, #,>+3>*7 D8\$4(*+%3+E4.256D8+%.:34 .+%F8
(MLSS) on - line.

" \$8\$0*2+E%*46\$" , " \$8+=7*4\$8\$626=,O,%7\$4\$8&("6+,2 25%,1 >\$ *78\$70"*4.*
#=E>,4 6\$" +1#, (* \$2+D4#,2 >\$ +, #,>+3>,18 .+38 2O".+&(*83 *56\$+&+\$.3 .

;+, O%*&+", 0"\$8,(E4 %E4 #%,4 +3 0*R\$(*8E 6\$>7M3.34>\$ #%\$5(\$+,#,"*7+\$"
#%,.>E63 0"\$=1(\$+,4 Fe, (D.: 0,."(*+%"6F8 \$8+= "F8 (1 61%"\$+ 1 *O*0%"6E 5"\$ +3
0D.(2.3 6\$" #,(&6%28.3 +,2 N:O<%,2 6\$" +3 0%\$.+"6E6\$+\$#, =D(3.3 +,2 O"\$8,(D8,2
+34*#"# =D,2.\$4 =&.#34 .+3 0*R\$(*8E 6\$>7M3.34

<"c 9"7* % d,e*)*)

m\$ 6\$+\$.6*2\$.+*7 8D\$0*R\$(*8E 6\$>7M3.34,(7:8 0"\$+&.*:8 (* +38 2#&%/,2.\$,
R,#=".(D83 (#*%".+%*O<(*83 \$6+"8"6E5DO2%\$(* #=\$7.", \$#< \$8,R*70:+, /&=2H\$,
0"&0%,(, #%<.H\$.34, #%,.+ \$+*2+"6&6"56="0F(\$+\$6\$" RD.+%,2==,5E4 =&.#34.

G*#70*4\$#<R*.34 (RD.+%\$+,2 #2>(D8\$ \$8\$%+3(D8,(* +3=*6,#"6D4 %&H0,24\$#<
+385DO2%\$\$,035,18 +38=&.#3 #%,4+, 6*8+%"6O%*&+",

P #*%".+%*O<(*83\$6+"8"6E5DO2%\$34 0*R\$(*8E4 6\$>7M3.34>\$ OD%*\$8\$%+3(D8,
6\$+&+, (E6,4 +34 .1.+3(\$.28*/14 \$#\$5:5E4 *#"#="<8+:8, +, ,#,7, >\$ \$#,+*=*7+\$ "\$#<:

- 1 6*8+%"6<6\$8&=" .2==,5E4 *##="#<8+:8 (* =*6&83 \$#,+%"&55".34 (<#,2
+,#,>*+*7+\$" 3 \$8+=7\$*##="#<8+:8) (* %2>("M<(*83.+&>(3 2#*%/*7=" .34 (D.:
+3=* .6,#"6,1 /*"%".+3%7,2

- 2 #=*2%"6&6\$8&="\$.2==,5E4 *##="#<8+:8 (* %2>("M<(*83.+&>(3 2#*%/*7=" .34
(D.: +3=* .6,#"6,1 /*"%".+3%7,2

- ;+3%75(\$+\$+:8 6\$8\$="F8.2==,5E4 *##="#<8+:8

- K8+=7\$*##="#<8+:8 +1#,2 vortex , *=&/" .+34 #\$\$,/E4 15m3/hr #,2 >\$,035*7 +\$
*##="#D,8+\$#\$' *2>*7\$4.+ ,8 #\$/28+E "=1,4

- ;1.+3(\$ \$8D=62.34+34\$8+=7\$4* #*%7#+: .3 .28+E%3.34

I, .1.+3(\$.28*/ ,14 #\$\$5:5E4 *##="#<8+:8 >\$ *78\$" 6\$+\$.6*2\$. (D8, \$#<
\$8,R*70:+, /&=2H\$ AISI 304.

A*%(" +%"6&340*R\$(*8E46\$" *:+"%"6& +,2 6\$8\$=" ,1 2#*%/*7=" .34>\$ +, #,>*+3>*7
8D,4 %2>("M<(*8,4 ,0,8+:+<4 2#*%/*7=" .+E4 6\$" O%&5(\$.256%&+3.34 *##="#<8+:8 \$#<
\$8,R*70:+, /&=2H\$ F.+* +\$ *##="#D,8+\$8\$ (38 #\$\$%\$.1%,8+\$#\$< +, 2#*%/*7="7M,25%<
<.,,;)*

S78\$"58:.+< <+" 5"\$ +38 *##="+2/E \$#,=1(\$8.3 (* \$6+"8,H,=7\$ UV, 6%". (<+,\$+,
#\$\$%&5,8+\$#\$,+=*7 3 0"\$15*" \$+,2 #%,4 \$#,=1(\$8.3 25%,1. ;+38 #*%7#+: .3 *6%,E4SSG3
0"\$15*" \$6\$>,%7M*+\$#\$< +3 .256D8+%;: .3 .+*%F8, 3 #,7\$.1(O:8\$ (* +3 H"H=" ,5%O7\$
6\$" +38 #\$\$%6+"6\$D#*8\$ D/*" +"(E SS o 10 mg/l.

Z"\$ +38 *7+*2R3\$2+E4+34 +"(E4 *##="D5*+\$"3 *56\$+&.+\$.3 #%"8+38 \$#,=1(\$8.3
O7=+%,20"E>3.34 (* *#&==3=,24 2O\$.(&+"8,24 07.6,24. P 0"E>3.3 (D.: +:8 O7=+%;:8
\$2+,1 +,2 +1#,2 *##="+25/&8*+\$"(* H\$%1+3+\$8\$"3 \$8+7.+%,O3#=1.3 +,24 578*+\$(* +, 70",
+, 8*%<+34*R<0,2 +,24, *##="+25/&8,8+\$4,"6,8,(7\$.+38 6\$+\$8&=: .3 3=*6+%"6E48D%5*" \$4
6\$" 8*%,1. I\$ \$#,\$6%28<(*8\$.+*%& ,035,18+\$" .+38 *7.,0, +34 *56\$+&.+\$.34. I,
.1.+3(\$ >\$ 2# ,=,5".+*7 F.+* 8\$ *##="+25/&8,8+\$" +\$ #\$\$%6&+:

- A\$%,/E ./0"\$.(,1 : 450 m³/hr
- ;256D8+%;: .3 .+*%F8 *".<0,2 +,2=&/" .+ ,8 : SS 40 mg/l
- ;256D8+%;: .3 .+*%F8 *R<0,2 6\$+&(D5".+ ,8 : SS 5-6 mg/l
- I, #,>D+3.3 : 0*R\$(*8E .62%,0D(\$+,4
- g2>(<4 0"E>3.34: 7,5 m³/(hr m²)

I\$ 0"\$25\$.(D8\$ \$#< +"40*R\$(*8D46\$>7M3.342O".+&(*83 6\$" 8D\$ *.D%/ ,8+\$".+3
0*R\$(*8E +,2 O7=+%,20"1=".345"\$+38 #*%\$"+D%\$#,(&6%28.3 +:8 \$":%,1(*8:8 .+*%*F8.
S#7.34 *78\$"028\$+E3 #\$\$\$&6\$(U3+34 (,8&0\$4 O7=+,%\$8.346\$>F4 6\$" +346\$+&8+,(,8&0\$4
\$#,,=1(\$8.34 (* UV, (D.: \$5:5,1 6\$" /"%".(,1 6\$+&==3=,2>2%,O%&5(\$+,4.,+ O%*&+",
*".<0,2 +34 (,8&0\$4 0"1=".34, +, ,#,7, ,035*7 +38 #\$\$%,/E \$#' *2>*7\$4 .+, O%*&+",
O<%+" .34+,2 \$5:5,1 0"&>*.34.

m\$ +, #,>+3>*7 O7=+%, +%" +,H&>("\$4 *#*R*%5\$.7\$4 +1#,2 ,%"M<8+",2
#*%".+%"O<(*8,2 +2(#&8,2 .

I\$ #%,4*#*R*%5\$.7\$25%&>\$,035,18+\$" (* O2."6E %,E \$#< +, *.+*%"6< #%,4 +,
R:+%"6<+,2 +2(#&8,2 . ;+38 DR,0, +2 O7=+%,22#&%/" 2#*%/"=" .+E4#,2 0"\$+3%*738
*=&/" .+3 .+&>(3 25%F8., 6\$8&="+,2 O7=+%,2

.6*="+<4 +,2 O7=+%,278\$"#\$< \$8,R*70:+, /&=2H\$ *8F +, 0"3>3+"6<(D., \$#\$<
"0"6< 1O\$.(\$ #,,=2\$("07,2 ((D5".+3 0"&.+3 \$ #<:%:8 60 (m 0"\$%"*(D8, . * *16,=\$
\$8+"6\$+\$.+&."(\$ #=\$7."\$ B\$+& +3 =*"+,2%57\$+, &8: (D%,4 +34 62="80%"6E4#"O&8*"4
O7=+,%\$8.34*2%7.6*+\$" #&8: \$#\$< +3 .+&>(3 +:8 25%F8 F.+* 8\$ 0"*26,,=18*+\$" 3
*#">*F%3.3 <=:8 +:8 #=\$".7:8 +,2 0"3>3+"6,1 (D.,2 \$==& 6\$" +, 0"\$0,/ "6< \$2+<(\$+,
\$8&.+%,O, 6\$>&%".(\$+34 *#"O&8*"4O7=+,%\$8.34

I, O7=+,%\$#,,+*=*7 *8"\$7\$6\$+\$.6*2E (\$M7(* +"4 \$8+=7*4\$8+7.+%,O34#=1.34 6\$"
\$#,(&6%28.34 .+,%\$55"07:8 #,2 H%7.6,8+\$".* *"0"6&0"\$(\$,%O:(D8,24 /F%,24 (D.\$.+,
6\$8&="6\$+&8+3+,2 O7=+%,21, .256%<+3(\$ 0"\$>D+**8.:(\$+:(D8\$ 3=*6+%<0"\$+&>(34
#,2 *=D5/,28 +3 =*"+,2%57\$+34 \$8+7.+%,O34#=1.34 6\$" +34 \$#,(&6%28.34 +:8
.+,%\$55"07:8 B,8+& .+, O7=+%,*78\$" *56\$+*.+3(D8,4 . * 20\$+.,+*5D4 *%(&%", ([g65)
6\$+&==3=,5"\$ *R:+*%"6</F%, , +, # "6<4 3=*6+%,=,5"6<4#78\$6\$4+%,O,0,.7\$4 "/,1,4 6\$"
*=D5/,2 +,2 O7=+%,2

B\$+&+3 =*"+,2%57\$, O7=+,%\$%\$\$(D8*"+&."(, (D/"4<+,2 +\$ 3=*6+%<0"\$+&>(34
0F.,28 .E(\$ 2U3=E4\$8&8+3.+&>(34 6\$" *8*%5,#,"E.,28 D+."5"\$ ("6%</%,8"6<0"&.+3(\$
+, .1.+3(\$ #*%".+%,OE4+,2 O7=+%,26\$" +\$2+</%,8\$ +38 \$8+=7\$8+7.+%,O34#=1.34
(D/"4<+,2 3 \$8&8+3.+&>(3 #D.*" #&="." /\$(3=<+*%, .3(*7, . Z"\$+38 #*%7#+.3 \$8<0,2
+34 .+&>(34 . * \$6<(\$ 2U3=<+*%, .3(*7, 2#&%/" 6\$" +%7+, 3=*6+%<0", .+&>(34
.28\$5*%(,1 6\$" =75, 2U3=<+*%\$0"&+\$R32#*%/*7=" .34\$.O\$=*7\$4 6\$+&8+3+,2 O7=+%,21\$
.+,%\$5570"\$#=1.34 .2==D5,8+\$".* *"0"6<*8.:(\$+:(D8, 0,/ *7, \$#\$< <#,2 \$#,\$(6%18,8+\$"
(* "0"\$7+*%\$8+=7\$.+,%\$55"07:8 3 =*"+,2%57\$+34 ,#,7\$4 *=D5/*+\$" \$#\$< 01, "0"\$7+*%\$
3=*6+%<0"\$+&>(34 .

I, 6\$8&="+%,O,0,.7\$4 6\$" +, 6\$8&="+,2 O7="+%,2D%,28.+3 .+DU3 +,24 \$O\$"%*+&
6\$=1((\$+\$ \$#< (#\$6=\$H\$0:+E =\$(\$%78\$6\$"6"56="0F(\$+\$\$.O\$=*7\$4

I\$ **R*%5\$. (D8\$ 25%& 2#*%/"=7M,28\$#< +3 0*R\$(*8E +,2 O7="+%,2 (D.:
2#*%/"=" .+E=*#+E4.+DU346\$" ,035,18+\$" (D.: 6\$8\$=" ,1 .+,8 (*+%3+E#\$\$,/E4.

\$5;.9 7)*

Z"\$+38 \$\$,=1(\$8.3 +:8 **R*%5\$. (D8:8 =2(&+:8 , (*+& +3 H",=,5"6E **R*%5\$.7\$
6\$" +, O7="+%0"1=" .34, >\$ /%3."(,#,"3>*7 .1.+3(\$ \$\$,=1(\$8.34 (* UV \$\$, /+,1 +1#,2. I,
.1.+3(\$ >\$ 6\$=1#+*"+38 #\$\$,/E +34+*="6E4O&.34. I, .1.+3(\$ >\$ 2#,,=,5".+*7 F.+* 8\$
"6\$8,#",,18+\$" +\$ #\$\$%\$6&+:6%" +E%"\$

- A\$%,/E ./0"\$.(,1 : 450 m³/hr
- ?"6%,H"\$6<O,%+7,.+38 *7.,0, : 10⁵ MCN/100 ml
- ?"6%,H"\$6<O,%+7,.+38 DR,0, : < 200 MCN/100 ml
- I1#,4 =\$(#+E%:8 : _\$(3=E4 #7*.34 2U3=E4D8+\$.34
- ;256D8+%:.3 .+*%*F8 : o 10 mg/l
- ?D5*>,4 \$":%,1(*8:8 .+*%*F8 : o 30 (m
- V"\$#*%\$+<+3+\$2(&+:8 : o 70 % /cm
- S=&/" .+3 0<.3 \$6+"8,H,=7\$4 p 60 mWsec/cm²
- ;28+*=" .+E4 5E%\$8.34: o 85 %
- ;28+*=" .+E4 %1#\$8.34: o 85 %
- ;28+*=" .+E4 0"\$#*%\$+<+3+\$(\$801\$: o 95 %

n#:4 #%,.0",%7.>36* .+38 k5""8,,=,5"6E ?*=D+3, 3 *56\$+&+\$.3 +,2 .2.+E(\$+,4
18 =\$(#+E%:8 UV (* ,8,(\$+."6E "/1 10,2 kW 6\$" *=&/" .+3 \$#<0,.3 .+, *8*%5<5"\$
\$#,1(\$8.3 O&.(\$ 250 - 265 nm 35% >\$ *R\$.O\$=7M*+\$ *#">2(3+& *#7#*0\$ \$\$,=1(\$8.34
(* #*% ">F%" \$.O\$=*7\$4

K8&0,/,4 +,2 D%5,2>\$ #%,.6,(7.*" \$8\$=2+"6,142#,,=,5".(,14 +,2 6\$+\$.6*2\$.+E
+,2 .2.+E(\$+,4 , <# ,2 (* H&.3 +38 6\$+\$.6*2\$.+"6E 0"\$(<%O:.3 6\$" +\$ 0*0,(D8\$
./0"\$.(,1 >\$ \$\$,0*"681*+\$" 3 =**+,2%5"6E#&%6"\$+34\$#,1(\$8.34 .

I, .1.+3(\$ >\$ \$\$,+*=*7+\$ "\$#<:

A35E \$6+"8,H,=7\$4UV: K2+E *78\$".2.,"/7*4 =2/8"F8 20%%\$%51%,2\$(3=E4 #7*.34
+1#,2, #,2 *6#D(#,28 (,8,/%:(+\$"6E \$6+"8,H,=7\$.* (E6,4 61(\$+,4 253,7 nm, 3 ,#,7\$
\$8E6*".+3 HD=+".#*%"/,E 5"\$+38 6\$+\$.+%,OE+:8 #>,5<8:8 ("6%,,%5\$8".(F8 .

F%,4 *#\$OE4 P *#\$OE 578*+\$. " \$8,"/+< 6\$8&="

:1.+3(\$ *=D5/,2 .+&>(34: \$#,+*=,1(*8, \$#< \$8,R*70:+, #+*%15",6\$+\$.6*2\$.(D8,
\$#< \$8,R*70:+, /&=2H\$ #,2 *R",%%,#+7+\$#\$< 6\$+&==3=,\$8+7H\$%,

BD8+%,*=D5/,2 5"\$+38 6\$+\$5%\$OE+:8 :%F8 =*"+,2%57\$4:8 .2.,"/"F8 6\$" +34
6\$+&+\$.34 +:8 =2/8"F8. I, .1.+3(\$ OD%*"("6%,*#*R*%5\$.+E *=D5/,2, ,><83 6\$"
#=36+%,=<5",5"\$#=E%3D=*5/, =*"+,2%57\$4

BD8+%,0"\$8,(E4 "/,1,4 5"\$+38 (*+&0,.3 6\$" =EU3 .3(&+:8 .+\$.+,"/*7\$ UV
(6\$+&+\$.3 =2/8"F8, +%,O,0,+"6F8, D8+\$.34 \$6+"8,H,=7\$4 6\$.).I, .1.+3(\$ #\$\$%D/"",/1
.* 6&>*.+,"/*7, UV 6\$"OD%*#=\$6D+\$2(#7*.34 0*0,(D8:8 6\$" *#"6,"8:87\$4.

:1.+3(\$ 6\$>\$%".(,1 +:8 =2/8"F8.

n=\$ +\$ (D%3 +,2 *R,#=".(,1 (=2/87*4 <%5\$8\$ 6=*(,6"HF+"\$ 6+>) +\$,#,7\$
+,#,>*,18+\$" *8+<4 6\$" 6\$+& (E6,4 +,2 6\$8\$="1 >\$ *78\$"./*0\$.(D8\$ 5"\$ 2#\$7>%"\$
*56\$+&+\$.3 .

I\$ \$#,=2\$.(D8\$ =1(\$+\$ >\$ *RD%/ ,8+\$"#\$< +,8 2#*%/"="+.E +,2 6\$8\$="1 6\$"
,035,18+\$" (* O2."6E %,E.+o O%*&+",O<%+" .34+,2 \$5:5,1 0"&>*.34.

7';,5)' ,5 ;)\$*)

f8\$ 8D, \$8+=",.+&.", \$8\$626=,O,%7\$46\$" \$#,(&6%28.34 #*%7..*\$4 =&.#34 >\$
6\$+\$.6*2\$.+*7, <(", (* +, 2O".+&(*8, .

m\$ +, #,>*+3>,18 01, (2) 2#,H%1/"*4 \$8+=7*\$8\$626=,O,%7\$4'=1,4. B&>* \$8+=7\$>\$
0"\$>D+*H&.3 (pedestal) (* \$2+<(\$+, .1.+3(\$ \$8D=62.34- 6\$>D=62.34 \$8,R*70:+, \$5:5<
6\$+&>="U34 0"6=*70\$ \$#,(<8:.34 *=\$.+"6E4 D(O%\$R346\$" H\$=H70\$ \$8+*#" .+%,OE4
=2(&+:8 .

;+,8 6,"8< 6\$+&>="#+ "6\$5:5< +:8 \$8+= "F8\$8\$626=,O,%7\$4'=1,4 >\$ +, #,>*+3>*7
3=*6+%,(\$583+"6<#\$%/,/<(*+%, .

m\$ +, #,>*+3>,18 01, (2) 2#,H%1/"*4 \$8+=7*\$8\$626=,O,%7\$4'=1,4. B&>* \$8+=7\$>\$
0"\$>D+*H&.3 (pedestal) (* \$2+<(\$+, .1.+3(\$ \$8D=62.34 - 6\$>D=62.34
\$8,R*70:+, \$5:5< 6\$+&>="U34 0"6=*70\$ \$#,(<8:.34 *=\$.+"6E4 D(O%\$R346\$" H\$=H70\$
\$8+*#" .+%,OE4=2(&+:8 .

;+,8 6,"8< 6\$+>="#+"6-\$5:5< +:8 \$8+="F8\$#,(86%28.34 +34 #*%7.."4 =&.#34
>\$ +,#,>*+3>*7 3=*6+%,(\$583+"6<#\$%/,<(*+%, .

n=" , " \$8+=7*4+,2 \$8+=",.+\$7,2 " =1,4 >\$ *78\$".15/%,834 +*/8,=,57\$4 (*
*8.:(+\$:(D8, inverter.

\$ 1.7)* - \.<'>)*

K#< +, 8D, \$8+=",.+&.", \$8\$626=,O,%7\$46\$" \$#,(86%28.34 #*%7.."4 =&.#34 3
=&.#3 >\$ 6\$+>=7H*+\$+3 8D\$0*R\$(*8E #8/28.34 =&.#34 <#,>\$ H%7.6*+\$2#<.28*/E
\$8&0*2.3 (D.: 2#,H%1/" ,2 *5/2+E%\$\$D%\$

;+3 .28D/*"\$, 3 #*%7.."4 =&.#34 (\$M7 (* +38 \$8+7+, "/3 +34 2O".+&(*834
*56\$+&+\$.34, (D.: 01, (1 61%"6\$" 1 *O*0%"6E 6,/=+:F8 \$8+="F8>+"6E4*6+<#.34 >\$
\$8+=*7+\$".+, .256%<+3(\$ \$O20&+:.34 , \$O,1 #%,35,2(D8:4 >\$ \$8\$("/>*7 (* 0"&=2(\$
#, =23=*6+%, =1+3

P =&.#3 >\$ \$O20\$+F8*+\$(* O25,6D8+%3.3 . * .256D8+%:.3 .+*%*F8 +,2=&/" .+,8
20%. P \$O20\$+: (D83 =&.#3 >\$,035*7+\$" . * #\$\$\$&#=*2%, .+*5\$(D8, /F%, 6\$" >\$
\$#,\$6%18*+\$" #*%",0"6& (* "0"6&, /E(\$+\$ 5"\$ 8\$ #35\$78*" . * 8,(7(:4 =*"+,2%5,1.*4
*+\$"%*7*4, " ,#,7*4 H&.*" +34 &0*"&4+,24 018\$+\$" 8\$ 0D/,8+\$" 6:0"6,14 SBK 190801,
190802, 190805." VE(,4 >\$ \$6,=,2>E.*" <=*4 +"4 8<("(*4 0"\$0"6\$.7*4 5"\$.18\$U3
.1(H\$.34 (* \$0*",0,+3(D83 *#"/*7%3.3, 3 ,#,7\$ 018\$+\$"8\$ 0D/*+\$" 6:0"6,14 SBK190801,
190802, 190805.

I, .256%<+3(\$ \$O20&+:.34 >\$ *78\$".+*5\$(D8, . * 6=*".+< 6\$" \$#,.1(*8,
6+7%,"m\$=*"+,2%5*7 F%*4/ 3(D%\$ 5"\$5E(*%3=*"+,2%57\$

;1(O:8\$ (* +38 k5""8,=,5"6E ?*=D+3 3 *#="*5<(*83 (,8&0\$ >\$ #D#""8\$ *78\$"
"6\$8E8\$ #\$\$\$=&H."

Ø k0%\$2="6E<%+" .33,5 m3/h

Ø N<%+" .3.+*%*F8 140 kg DS/h

Ø A,..+< #+3+"6F8\$":%,1(*8:8 .+*%*F8 60-70%

P \$O20\$+: (D83 =&.#3 >\$ \$#,\$6%18*+\$" (D.: 6,/= "F8 (*+\$O,%&4 ,%"M<8+":86\$"
6*6=" (D8:8, . * #\$\$\$&#=*2%, /F%, (* .+D5\$.+%,, 6\$" >\$ O,%+F8*+\$" . * O,%+35&
\$2+,6783+\$

I\$.+%\$5570"\$6\$" +\$ 8*%&D6#=2.34 \$#< +38 \$O20&+:.3 , <#,:4 *#7.34 6\$" +\$
0"\$25&M,8+\$25%&\$#< +3 0*R\$(*8E #8/28.34 (D.: *#D6+\$.34 +,2 0"6+1,2 .+%\$55"07:8 >\$
#" .+%DO,28(+3 H\$%1+3+\$+, *7.,0, +34 *56\$+&+\$.34.

"30 \$35) 0>0*) - \$ 0>0*)

K#< +, 8D, 6*8+% "6<\$8+=",.,+&.", >\$ *66"8*70702(,4 6\$+\$>="#+"6<4\$5:5<4 \$#< HDPE N315/=+. - 10\$+(. A,2 >\$ 6\$+*2>18*+\$"##%,4 +38 SSG S#"0E \$#< +, 1U,4 +:8 BISG 6\$" (D/%" +38 SSG 2O7.+\$+\$" 0"\$+,(E N315 /=+. , 3 ,#,7\$ >\$ \$R",#,"3>*7, (* \$#,+D=*(. \$ \$#< +38 >D.3 \$2+E 6\$" (D/%" +38 *7.,0, .+38 SSG8\$ +, #,>*+3>*7 (<8, D8\$4 \$5:5<4 N315/=+. .

K8+7.,"/\$ \$#< +38 DR,0, +34 SSG6\$" (D/%" +38 >&=\$..\$ \$#\$"+*7+\$0702(,4 \$5:5<4 PVC N315/=+. . ."%&441. *#"0E \$#< +38 DR,0, +34 SSG6\$" (D/%" +, 1U,4 +:8 BISG 2O7.+\$+\$"PVCN315/=+. , >\$ +, #,>*+3>*7 D8\$4\$5:5<4 N315/=+. . (D/%" +\$ BISG 6\$".+38 .28D/*"\$ 0702(,4 N315/=+. . (D/%" +38 >&=\$..\$.

m\$ 03(",2%53>,18 01, 0"\$+,(D4 (7\$ \$8&8+36\$" (7\$ 6\$+&8+3+:8 BISG. ;+38 \$8&8+3 0"\$+,(E #,2 \$6,=,2>*7 /:(\$+<0%,(, >\$ +, #,>*+3>,18 01, \$5:5,7 N315/=+. . I, .6&((\$ >\$ 0"\$(\$,%O:>*7 (* #=&+,4 1,25(. m\$ +, #,>*+3>*7 &((,4 . * #&/,4 15*6. 6&+: \$#< +,24 \$5:5,14 (D/%" 20*6. #&8: \$#< +38 6=*70\$+,24. ;+38 .28D/*"\$ >\$ 578**"#7/:.3 (* 6\$+&==3=\$#%,q<8+\$ (D/%" 20*6. 6&+: \$#< +38 +*="6E .+&>(3 +,2 *0&O,24, .+38 0* +*="2+\$7\$.+%F.3 +:8 20*6. >\$ +, #,>*+3>*7 2="6<+34 AIA -0150. ;+38 6\$+&8+30"\$+,(E #,2 \$6,=,2>*7 \$.O\$=+<0%,(,24 *8+<4,"6".(,1 >\$ +, #,>*+3>,18 4 \$5:5,7 N315/=+. . I, .6&((\$ >\$ 0"\$(\$,%O:>*7 (* #=&+,4 2,26(. m\$ +, #,>*+3>*7 &((,4 . * #&/,4 15*6. 6&+: \$#< +,24 \$5:5,14 (D/%" 20*6. #&8: \$#< +38 6=*70\$+,24. ;+38 .28D/*"\$ >\$ 578**"#7/:.3 (* >%\$2.+<2="6<=\$+,(*7,2 (D/%" 15*6. 6&+: \$#< +38 *%2>%&,2 0%<(,2. m\$ +, #,>*+3>*7 (7\$.+%F.3 #&/,24 10*6. +34 AIA -0155 6\$".+38 .28D/*"\$ >\$ \$6,=,2>E." \$\$.O\$=+"6E #%, #&="U36\$".+%F.3 5 *6. 626=,O,%7\$4\$.O&=+,2.

; * <=, +, (E6,4 +:8 .6\$((&+:8 >\$ 578**"\$8+" .+E%"R\$ (*+\$=="6&#*+&.(+\$\$. B\$+& (E6,4 +:8 6\$+\$>="#+"6F8>\$ +, #,>*+3>*7 . * 6&>* \$5:5< \$#< D8\$O%*&+",*R\$*%".(,1 #,2 >\$ OD%*H\$=H70\$". \$5:5E4 - *R\$5:5E4 \$D%\$

" \$5:5,7 \$#\$5:5E4 >\$ R*6"8,18 \$#< +38 DR,0, +34 SSG \$#< 6\$+&==3=\$ 0"\$(\$,%O:(D8, O%*&+",O<%+" .34 3 0* .180*.3 (* +,8 2#,>\$=&..", \$5:5< >\$ *#" +2/>*7 0"\$ (D.,2 O%*\$+7,2*=D5/,2 %1>(" .34 %,E4

4.2 " ^GNYIXC_L "NKQF?XWL";

;+,8 #78\$6\$#,2 \$6,=,2>*7 070*+\$'\$8\$=2+"6& *R,#=".(<4 *#D6+\$\$.34+34SSG

3/3	)\$9+;930	\$&')*+-'-	<=	)'-1 13	>393@1 9+-1+@3	'5"' . +->.- (KW)	*\$+1'.9;+@'- \$&')*+-'-
1	7.3575G5.9 0&	75.&0*.3=&(3 =&8*.3	::<.	1	Q = 500m3/h		1
		0@9(.3*,\$ 95=@. 0	::<.	1	1 = 7		1
		@=&00@0*,\$ D& E@0,0 5.	::<.	3(2+1)	Q = 170Nm3/h, 400mbar		2
		.@C\$&>3\$5"30 @75.E5&8&0*,0	::<.	1			
		(3E8& 00@\$7&50,0	::<.	1	Q = 3m3/h		1
3	1&3839& - " (/ 75.&005&&8@30	" \$&(*, 0 1&357&839,0	::<.	2		0,80KW	2
		" \$&(*, 0 73"&*.373&,0,0	::<.	2		1,50KW	2
		" \$&(*, 0 57 \$=3*5.&>3@0 0	::<.	2		1,50KW	2
		"*8 . " (@(83=3.& 0 "&*.&(B"	::<.	4(2+2)	Q = 204m3/h, H = 4m 3,10KW		2
		"*8 . " (@(83=3.& 0 &8@30	::<.	2(1+1)	Q = 78m3/h, H = 4m 1,30KW		1
		"*8 . 75.&005& &8@30	::<.	2(1+1)		0,80KW	1
		0@0*,\$ D& E@0,0	::<.	1	720DKMM Nm30KMMQ		
		=@0*,. 0	::<.	3(2+1)	Q = 1174Nm3/h, 450mbar	30KW	2
4	(C,>,0, - 0*. 99&D&	95=@. , G50*.3 HIJ .	::<.	1	L = 9m	0,25KW	1
		"*8& 0*. 99&D&B"	::<.	2(1+1)	Q = 15m3/h, H = 4m 0,70KW		1
55	7 E@"0, - =@D *B0,	59E@*,. 0 5.	::<.	1	Q = 155 Nm3/h	5,9(W	1
		"*8 . *.3=3D . C5&(,0 5(*37&0,0	::<.	2(1+1)			1
		78,,0 \$3" D =@D *B0,0	::<.	1	Q=3,5m3/h, 140kg DS/h		1
		"*8 . 78@0,0=@D *B0,0	::<.	1	Q = 6m3/h, 4bar	1,50KW	1
6	738@\$ "0,	=&8*.3	::<.	1	Q=450m3/h, 7,5m3/h*m2	7,50kW	1
		78,.50 0@9(.3*,\$ UV	::<.	1	18IM<J:RQ;SV	10,20kW	1
		D30&\$5*.&(, "*8 . FeCL3	::<.	2(1+1)	Q = 3,9lt/h	0,60KW	1
7	D& E5"5.95& 0	0@9(.3*,\$ @730* C\$3@	::<.	1			1
		, />	::<.	1			1
		,85(*.3839&(3& 7&" (50	::<.	1			1
		(8BD&B05&0	::<.	1			1
		,85(*.3=B*&0\$30 @8,0	::<.	1			1
		"*&(5. @"&(, 7.30* 0&	::<.	1			1

		""&(857*&(, 7.30* 0&	::<.	1			1
8	@*3\$ *&0\$3&- \$5*.,*&(30 5G378&0\$3Q*)	0@0*,\$ @*3\$.	::<.	1			1
		3G@93"3\$5*.3	::<.	2			2
		0@9(5"*B0, 0*5.5B" (MLSS)	::<.	2			3
		\$5*.,*,0 7.3E,0 " (@(83=3.& 0 "&*.&(B"	::<.	1			1
		\$5*.,*,0 7.3E,0 " (@(83=3.& 0 &8@30	::<.	1			1
		\$5*.,*,0 7.3E,0 7.30 =@D *B0,	::<.	1			1
		\$5*.,*,0 PH	::<.	1			1

(*) (*+%3+"6<4*R,#=".(<4 6\$" , " \$2+,\$+").(7 \$#,+*=,18 \$8+"6*7(*8, &==34
*8<+3+\$4+,2 D%5,2

4.3 %FI@I?QKLVQ?F?XFAXEIL

Z"\$+ "4\$8&56*4*#D6+\$.34 6\$" *6.25/%,8".(,1 +342O".+&(*834 SSG >\$ /%*"\$.+*78\$
6\$+\$.6*2\$+. ,18 8D\$6+7%"\$2 >\$.+*5&.,28 +,8 8D, *R,#=".(< . ?D%,4+:8 2O".+&(*8:8
6+"%7:8<#,2 , *R,#=".(<4 +,24 >\$ \$8+"6\$+\$.+>*7 >\$ \$8\$H\$>(".*7 E >\$ +,#,>+*3>*7
#"#%<.>+,4 *R,#=".(<4 , >\$.28+3%3>,18 6\$" <#,2 2#&%/,28 #%,H=E(\$+\$6\$" M3("D#,2
D/,28 #%,61U*" \$#< +, #D%\$.(\$ +,2 /%<8,2 (%35(\$+F.*"4 6=#) >\$ *#" .6*2\$+. ,18 E >\$
\$8+"6\$+\$.+>,18.

;+"4 6+"%"\$6D\$6\$+\$.+&.*"4 #*%"=(H&8,8+\$+\$6&+:>":

%!,3,5 \.)**3>7 <"c 9"7*) "3,)95.

P 6&+,U3 +,2 6+"%7,278\$",%>,5:8"6E *R:+"%"6F80"\$+&.*:8 11.00mx5.50m.

;28,="6E *#"O&8*" \$60,50m² H", (3/\$8"6E4 #, "<+3+\$46\$+\$.6*2E4 #*%"=(H&8*"

- _F%, 3=*6+"%6F8#"8&6:8, 6\$>\$%E4#"O&8*" \$411,75(²
- _F%, O2.3+E%:8, 6\$>\$%E4#"O&8*" \$445,00(²

P 6\$+\$.6*2E *78\$"D8\$".<5*", 6+7%"\$#< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4C25/30
(* ."03%< ,#=".(< B500C.

B&+: \$#< +38 #=&6\$ ".,5*7,2 6\$>F4 *#7.34 6\$" \$#< +\$ #D0"=\$>*(*=7:.34 >\$
+,#,>+*3>*7 .62%<0*(\$ 6\$>\$%"<+3+\$412/15.

" *R:+"%6D4, "/",#, "7*4 #E%:.34 >\$ *78\$, #+, #="8>, 0, (E (#\$+"6E (* . *8&M .+, 1U,4 +34 #,0"&4 6\$" .+, 1U,4 +,2 #%"6",1. m\$ +, #,>*+3>*7 3/, (,8:+"6< #&8*= " *:+"%6D4 +, "/",#, "7*4 >\$ *78\$"0%, ("6D4 n=*4 , " +, "/",#, "7*4 >\$ *78\$*"#"/%". (D8*4 *:+"%6& 6\$" *R:+"%6&(* \$.H*.+,+. "(*8+,6,87\$(\$ 2,5*6.

" +, "/",#, "7*4 >\$ *78\$"/%:(\$+ ". (D8*4 *:+"%6& (* #=\$.+"6< /%F(\$ 6\$" *R:+"%6& (* \$6%2="6<." (*8+</%:(\$.

I\$ 0&#*0\$ >\$ *78\$"\$#< *"0"6<\$8+,"=".>3%<2="6< H", (3/\$8"6< 0&#*0, . ?#%, .+& \$#< +,24 /F%,24 +:8 3=*6+%"6F8#"8&6:8 >\$ 2#&%/,28 (,8:+"6& 0&#*0\$.

A&8: \$#< +38 #=&6\$,%,OE4 \$#< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4C25/30 #&/,24 0,20*6 6\$" >\$ 6\$+\$.6*2\$.+,18 , " 6\$+&==3=*4(,8F.*"4 6\$" .+*5\$8,#,"E.*"4 D8\$8+" +34 25%\$.7\$4

" #,0"D4+:8 #&%"\$>1%:8>\$ 6\$+\$.6*2\$.+,18 \$#< =*26< (&%(\$%, #&/,24 3cm.

I\$ *R:+"%6& 6,2OF(\$+\$ +,2 6+%"%7,2>\$ *78\$" 6\$+\$.6*2\$. (D8\$ \$#< D5/%:(, \$=,2(78", 6\$" >\$ *78\$" *R,#=".(D8\$ (* +,24 \$#\$%\$7+3+,24(3/\$8".(,14 #*%" .+%,OE46\$" \$.O&="34. " >1%*4>\$ *78\$"3/, (,8:+"6D4 , *8F 5"\$ +,8 *R\$*%".(< +,2 /F%,2 #%,H=D#*+"\$ 3 +, #,>D+3.3 6\$+\$.6*2F8 (* 3/, (,8:+"6D4 #*%.70*4.* <=\$+\$ \$8,75(\$+\$.

m\$ =3O>,18 <=\$+\$ \$#\$%\$7+3+D+%"\$5"\$ +38 \$#,%,E+:8 ,(H%7:8 (* 6\$+&==3=*4 6=7.*"4.+38 ,%,OE 6\$" 6\$+\$.6<%2O*420%,%,D4F.+* 8\$ (38 .+\$=&M,28 8*%&\$#< +38 ,%,OE .+"4 #=*2%D4:8 6+%"%7:8

%',3,5 \.<'>*) ,,:5)

P 6&+,U3 +,2 6+%"%7,278\$",%>,5:8"6E *R:+"%6F80"\$.+&.*:8 15.00mx5.50m.

;28,="6E *#"O&8*" \$82,50m² H", (3/\$8"6E4 #,"<+3+\$46\$+\$.6*2E4 #*%"=(H&8*"

- _F%, 3=*6+%"6F8#"8&6:8, 6\$>\$%E4#"O&8*" \$45,20(²
- _F%, \$O20&+:.34 6\$" #%,*+,"(\$.7\$4 6\$" 0,,(D+%"3.34 #,=23=*6+%, =1+3 *#"O&8*" \$445,83(²
- _F%, \$#,>E6*2.34 +34\$O20\$+: (D834 "=1,4, *#"O&8*" \$420,00(²

P OD%,2.\$ 6\$+\$.6*2E +,2 6+%"%7,2>\$ *78\$"\$#< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4 C25/30 (* ."03%< ,#=".(< B500C. B&+: \$#< +38 #=&6\$ ".,5*7,2 6\$>F4 *#7.34 6\$" \$#< +\$ #D0"=\$>*(=7:.34 >\$ +, #,>*+3>*7 .62%<0*(\$ 6\$>\$%"<+3+\$ 12/15.

" *R:+"%6D4, "/",#, "7*4 #E%:.34 >\$ *78\$, #+, #="8>, 0, (E (#\$+"6E (* . *8&M .+, 1U,4 +34 #,0"&4 6\$" .+, 1U,4 +,2 #%"6",1. " *:+"%6D4 +, "/",#, "7*4 >\$ *78\$"0%, ("6D4

n=*4 , " +,/,#,7*4 >\$ *78\$ " *#"/%".(D8*4 *.:+*%"6& 6\$" *R:+*%"6& (*
\$.H*.+,+."(*8+,6,87\$(\$ 2,5*6.

" +,/,#,7*4 >\$ *78\$"/%:(\$+).(D8*4 *.:+*%"6& (* #=\$.+<6< /%F(\$ 6\$" *R:+*%"6&
(* \$6%2="6<."(*8+</%:(\$.

IS 0&#*0\$ +,2 /F%,2 \$O20&+:.34 >\$ *78\$"\$#< *"0"6<\$8+",=".>3%<2="6<\$8>*6+"6<
+.\$ /3("6& , H", (3/\$8"6< 0&#*0, . ;+, /F%, #%,H=D#*+\$3 6\$+\$.6*2E 6\$8\$=",1 (* ./&%*4 +,
RD#=2(\$ 6\$" +38 5%E5,%3\$#,(&6%28.3 /3("6F8 \$#\$< +, 0&#*0, , *8F , " +,7/, " >\$
*#*802>,18 (* #=\$670"\$#,%.*=&834. ?#%,.+& \$#\$< +,24 /F%,24 +:8 3=*6+%"6F8#"8&6:8
>\$ 2#&%/,28 (,8:+"6& 0&#*0\$.

IS 0&#*0\$ +:8 2#<=,"#:8 /F%:8 >\$ *78\$"*#7.34 H", (3/\$8"6,1 +1#,2 (* ..+D4
6=7.*"45"\$+38 \$#,%%,E+:8 8*%F8#=1.*:8 .

A&8: \$#\$< +38 #=&6\$,%,OE4 \$#\$< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4C25/30 #&/,24
0,20*6 6\$" >\$ 6\$+\$.6*2\$.,+18 , " 6\$+&==3=*4(,8F.*"4 6\$" .+*5\$8,#,"E.*"4 D8\$8+"+34
25%\$.7\$4

" #,0"D4+:8 #\$\$\$>1%:8>\$ 6\$+\$.6*2\$.,+18 \$#\$< =*26< (&%(\$%, #&/,24 3cm.

IS *R:+*%"6& 6,2OF(\$+\$ +,2 6+%"%7,2>\$ *78\$ " 6\$+\$.6*2\$.(D8\$ \$#\$< D5/%:(,
\$=,2(78", 6\$" >\$ *78\$"*R,#=".(D8\$ (* +,24 \$#\$%\$7+3+,24(3/\$8".(,14 #*%".+%,OE46\$"
\$.O&="34. S"0"6<+*%\$" >1%*4>\$ OD%,28#*%.70*45"\$+38 #%,.\$5:5E 8:#,1 \$D%\$8+<4
+,2 6+%"%7,2+, /F%, +34(3/\$8"6E4 \$O20&+:.34 3 >1%\$>\$ *78\$"3/,(,8:+"6E , *8F 5"\$+8
R\$%".(< +,2 /F%,2 #%,H=D#*+\$3 +,#,>D+3.3 6\$+\$.6*2F8 (* 3/,(,8:+"6D4 #*%.70*4.*
<=\$+\$ \$8,75(\$+\$.;+"4 #<+%*4\$ \$+,#,>*+3>,18 #"\$8\$670*4"8018,2.

k\$=,#78\$6*4 (,8,7 , (#&/,24 5mm), >\$ +,#,>*+3>,18 <#,2 #%,H=D#*+\$"5"\$ +,
O2."6< O:+".(< +:8 /F%:8 . P +,#,>D+3.E +,24 >\$ 578*"(* *"0"6D4#=\$.+ "6D40"\$+,(D4 \$#\$<
PVC,#,2 >\$.256%\$+,18 +,8 2\$=,#78\$6\$

;+, 6+7%",#%,H=D#*+\$"#=E\$34 *56\$+&.+\$.3 "/2%F8 6\$" .>*8F8 %*2(&+:8,
10%*2.34 6\$" \$#,D+*2.34 .

;* <=,24 +,24 /F%,24 #%,H=D#*+\$"0"&+\$R3*R\$*%".(,1 6\$" \$#\$<.(3.34 (* 076+2,
\$*%\$5:5F8.

m\$=3O>,18 <=\$+\$ \$#\$%\$7+3+\$D+%"\$5"\$+38 \$#,%%,E+:8 ,(H%7:8 (* 6\$+&==3=*4
6=7.*"4.+38 ,%,OE 6\$" 6\$+\$.6<%2O*420%,%%,D4F.+* 8\$ (38 .+\$=&M,28 8*%&\$#\$< +38
,%,OE .+"4 #=*2%D4:8 6+%"%7:8

%',3,5 "7"30",)

I, 6+7%"D/*" .28,="6E *#"O&8*" \$72,50(^ 6\$" 2#,0"\$"%*7+\$",24 *RE4\$8*R&"+3+,24 /F%,24:

- +,8 /F%, *56\$+&+\$.34 +,2 3=*6+%,#\$\$5:5,1 M*15,24 6\$" +34 0*R\$(*8E4 #*+*%=\$7,230,15(^
- +,8 /F%, +,2 5*8"6,1 3=*6+%"6,1#78\$6\$\$(3=E4 +&.34, 6\$>%"E4#"O&8*" \$49,00(^
- +,8 /F%, +,2 (*+\$. /3(\$+" .+E , 6\$>%"E4#"O&8*" \$411,70(^
- +,8 /F%, (D.3 +&.34, 6\$>%"E4#"O&8*" \$49,45(^

;+,24 /F%,24 +,2 P/i , +,2 3=*6+%"6,1#78\$6\$ +,2 (*+\$. /3(\$+" .+E #%,H=D#*+\$3 6\$+\$.6*2E 6\$8\$=" ,1 (* . /&%*4, 5"\$ +38 *R2#3%D+3.3+,24, 6\$" =*6&83\$#,%%,E46&+: \$#< +,8 (*+\$. /3(\$+" .+E .

m \$6\$+\$.6*2\$.>*7 .1(O:8\$ (* +"4#%,0"\$5%\$ODMSVVPS

I, 0&#*0, >\$ 578*" \$#< ,#=".(D8, .62%<0*(\$ 6\$" >\$ 03(" ,2%53>,18 ,#D4 #,2 >\$ *#"6,"8:8,18 (* 2#<5*", /F%, . " ,#D4 .+, 0&#*0, 5"\$ +38 *#"6,"8:87\$, >\$ 6\$=1#+,8+ \$" (* *+\$=="6D4/&%*4.

P OD%,2.\$ 6\$+\$.6*2E +,2 6+%"7,2>\$ *78\$" \$#< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4 C25/30 (* ."03%< ,#=".(< B500C. B&+: \$#< +38 #=&6\$ " ,5*7,2 6\$>F4 *#7.34 6\$" \$#< +\$ #D0"=\$>(*=7:.34 >\$ +, #,>*+3>*7 .62%<0*(\$ 6\$>%" "<+3+\$ 12/15.

A&8: \$#< +38 #=&6\$,%,OE4 \$#< ,#=".(D8, .62%<0*(\$ 6\$+35,%7\$4 C25/30 #& /,24 0,20*6 6\$" >\$ 6\$+\$.6*2\$.+,18 , " 6\$+&==3=*4(,8F."*4 6\$" .+*5\$8,#,"E."*4 D8\$8+" +34 25%\$.7\$4

" *R:+"%"6D4, "/, #, "7*4 #=E%:.34 >\$ *78\$", #+, #="8>,0,(E (#\$+"6E (* .*8&M.+ , 1U,4 +34 #,0"&4 6\$" .+, 1U,4 +,2 #%"6",1. " *.:+"%"6D4 +, "/, #, "7*4 >\$ *78\$" (#\$+"6D4 ;+,8 /F%, +,2 P/i >\$ +, #,>*+3>*7 6\$+&==3=33/,(<8:.3 . n=*4 , " +, "/, #, "7*4 >\$ *78\$" *#" /%".(D8*4 *.:+"%"6& 6\$" *R:+"%"6& " +, "/, #, "7*4 >\$ *78\$" /%:(\$+".(D8*4 *.:+"%"6& (* #=\$.+ "6< /%F(\$ 6\$" *R:+"%"6&(* \$6%2="6<."(*8+< /%:(\$.

I\$ *R:+"%"6& 6,2OF(\$+\$ +,2 6+%"7,2>\$ *78\$" 6\$+\$.6*2\$. (D8\$ \$#< D5/ %:(, \$=,2(78", 6\$" >\$ *78\$" *R, #=".(D8\$ (* +,24 \$#\$%\$7+3+,24(3/\$8".(,14 #%" .+%,OE46\$" \$.O&=" .34. S"0"6<+*"%" >1%*4>\$ OD%,28#%" .70*45"\$ +38 #%,. \$5:5E 8:#,1 \$D%\$8+<4 +,2 6+%"7,2;+, /F%, +,2 P/i , " >1%*4>\$ *78\$" 3/, (8:+"6D4 , *8F 5"\$ +,8 *R\$*%".(< +:8 /F%:8 #%,H=D#*+\$"3 +, #,>D+3.3 6\$+\$.6*2F8 (* 3/, (8:+"6D4 #%" .70*4 . * <=\$ +\$ \$8,75(\$+\$.;+"4 #<%+*4\$ +, #,>*+3>,18 #"8\$670*4"8018,2.

;+, 6+7%",>\$ #%,H=*O>*7>*(="6E 5*7:.3 (#=D5(\$ 0\$#D0,2) (* +38 ,#,7\$ >\$.280D,8+\$" 3 #*%("+"%65*7:.3 +,2 /F%,2 6\$" <=\$ +\$ (*+\$=="6&+(E(\$+\$ 5"\$+38 \$#,O25E H3(\$+"6F8+&.*:8 .

/F%,4 +:8 3=*6+% "6F8#"8&6:8 D/*" #*\$%6*74"\$+&.*"4 6\$" 3 0"&+\$R3:8 #*07:8 *#"+%D#*438 &8*+36\$"\$O\$=E *%5\$\$.7\$.* \$2+&

;+,24 /F%,24 +, 0&#*0, >\$ *78\$"\$8+,"=".>3%,1 H", (3/\$8"6,1 +1#,2 (* ".,018\$(\$, #=D5(\$ (* *#,R*"0"6<%3+"8,6,87\$(\$6\$#"#*%">F%"\$*:8 10*6.

m\$ =3O>,18 <=\$ +\$ \$#\$%\$7+3+D+%5"\$+38 \$#,%%,E+:8 ,(H%7:8 (* 6\$+&==3=*4 6=7.*"4.+38 ,%,OE 6\$" 6\$+\$6<%2O*420%,%%,D4F.+* 8\$ (38 .+\$=&M,28 8*%&\$#< +38 ,%,OE .+"4 #=*2%D4:8 6+"%7:8

.\,)' 9"75 %',3,5 \,)*"3>7

A%<6*"+\$5"\$ 2O".+&(*8, 6+7%"#,2 .+*5&M*" +,24 O2.3+E%*4+:8 2O".+&(*8:8 0*R\$(*8F8 \$*%".(,1 . P 6&+,U3 +,2 6+"%7,2*78\$",%>,5:8"6E *R:+"%"6F8 0"\$+&.*:8 6.00mx4.30m. f/*" .28,="6E *#"O&8*" \$25,80m² .

I, 6+7%",>\$.28+3%3>*7 6\$" >\$ *#.6*2\$+.18 E >\$ \$8+"6\$+\$.+>,18 <#,2 2#&%R,286\$+\$.+%,OD46\$" #%,H=E(\$+\$#,2 D/,28 #%,61U*" \$#< +, #D%\$.(\$ +,2 /%<8,2 (%35(\$+F.*"4, \$#,6\$+\$.+&.*"4 .,H&0:8 6=#).

;+, 6+7%",>\$ +, #,>*+3>,18 , " 8D," O2.3+E%*4+,2 2O".+&(*8,2 \$((,=#,.2==D6+3 .

.\,)' 9"75 %',3,5 ;',5.30,)

A%<6*"+\$5"\$ 2O".+&(*8, 6+7%"., P 6&+,U3 +,2 *78\$",%>,5:8"6E *R:+"%"6F8 0"\$+&.*:8 7.75mx4.40m. P .28,="6E +,2 *#"O&8*" \$*78\$"34,10m², #*%="\$ (H&8*"+,24 *RE4/F%,24:

- B*8+% "6F%, 5%\$O*7,2 6\$>\$%E4#"O&8*" \$41,20(²
- Z%\$O*7,=D5/,2, 6\$>\$%E4#"O&8*" \$410,00(²
- _F%, 8+,24, 6\$>\$%E4#"O&8*" \$43,60(²
- _F%, W.C., 6\$>\$%E4#"O&8*" \$43,60(²

I, 6+7%",>\$.28+3%3>*7 6\$" >\$ *#.6*2\$+.18 E >\$ \$8+"6\$+\$.+>,18 <#,2 2#&%R,286\$+\$.+%,OD46\$" #%,H=E(\$+\$#,2 D/,28 #%,61U*" \$#< +, #D%\$.(\$ +,2 /%<8,2 (%35(\$+F.*"4, \$#,6\$+\$.+&.*"4 .,H&0:8 6=#).

S#7.34>\$ \$8+"6\$+\$.+>,18 +\$ *70325*"8E4+,24 /F%,24 +,2 8+,24 6\$" +,2 W.C.

","<,"%") ""17,"%") \$35<, 03 \")

;+38 *8<+3+\$ +:8 S"0"6F8 I*/8"6F8 A%,0"\$5%\$OF8 #*%"=(H&8,8+\$" *"0"6D4
\$#\$"+E.*"45"\$+,8 *R,#="(< 6\$"+"4*%5\$.7*4#,2 #D#*8\$ *6+*=*.>,18 .

;+, I*1/,4 I*/8"6F8 A%,0"\$5%\$OF8\$8\$OD%,8+\$"5*8"6D4#%,0"\$5%\$OD4"\$ +,8
*R,#="(< 6\$" +,8 +%<#, *6+D=*.34+:8 *%5\$."F8 , " ,#,7*4 :4 +D+, "46\$=1#+,28 *2%1+*%,
#*07, \$#< +, \$8+7.+,"/, +,2 .256*6%"(D8,2 D%5,2

;* #*%7#+:3 \$2(O:87\$4 (* +, I*1/,4 I*/8"6F8 A%,0"\$5%\$OF8 2#*%"/1,28 +\$
\$8\$5%\$O<(*8\$.+, #\$\$%<8

;* #*%7#+:3 6*8,1 +:8 I*2/F8 V3(,##&+3.34, "/1,28 6\$+&.*"%&+\$ \$6<=,2>\$:

1. SISA
2. ASISA *O<.,8 0*8 2#&%/*" /.*+"6E SISA
3. S8\$%(.8".(D8\$ S2%:#\$q6&A%<+2#\$(HD)
4. S2%:#\$q6&A%<+2#\$(Sb)
5. V">8EA%<+2#\$(ISO, CEI 6=#)

ID=,4 5"\$ +,8 *R,#="(< #,2 \$8\$OD%*+\$+, #\$\$%<8+*1/,4 6\$" /\$%\$6+3%7M*+&\$"
H\$."6<4 *R,#="(<4 .+,8 A78\$6\$;2((<%O:.34 +,2 A\$%\$%+E(\$+,4+34 V"\$6E%2R34>\$
#%,.6,(".*7 6\$+& +3 O&.3 2#,H,=E4 #%,.O,%F8 A".+,#,"3+"6< ISO9001:2015 +,2
*%5,+.7,2 6\$+\$.6*2E4. P \$#\$7+3.3 \$O,%& +,8 H\$."6< *R,#="(< 6&>* .3(*7,2 (#/
\$8+=7*4\$8\$0*2+E%*4\$2+,6\$>\$%"M<(*8*4./&%*4 6=#) 6\$" </" .28,0*2+"6< *R,#="(< (#/
6\$=F0"\$.:=38F.*"4 6=#).

O?[EMF`@EL<E^?CEOROE@IXCGh

OFIQUEUCEOG

KO,%& +38 \$8+"6\$+&+\$.3 +:8 2O".+&(*8:8 \$8\$0*2+E%:8 (* 8D,24 #,2 D/,28
+,2=&/".+,8 +\$ =*"+,2%5"6&/\$%\$6+3%".+"6&#,2 \$8\$OD%,8+\$".+,8 .28,#+ "6< #78\$6\$
*R,#="(.1 6\$>F4 6\$" +38 *56\$+&+\$.3 ,(7:8 .+"4 \$8+7.+,"/*4 (,8&0*4 +34 *#D6+\$.34 +34
SSG S6+<4\$#< +38 #=E%3*56\$+&+\$.3 +:8 8D:8 \$8\$0*2+E%:8 #*%"=(H&8*+"6\$" 3
\$8+"6\$+&+\$.3 +,2 +%,O,0,+"6,1 6\$=:07,2 6\$" +,2 6\$=:07,2 .3(&+:8 (D/%" +,8 #78\$6\$
+%,O,0,7\$4 6\$" 3 *56\$+&+\$.3 .+*5\$8,1 62+7,2 0"\$6=&O:.34 /.180*.34 +:8
#%, \$8\$O*%>D8+:8 6\$=:07:8 #=3.7,8 +,2 \$8\$0*2+E%\$ A*%"=(H&8*+"\$" *#7.34 3

\$#,(&6%28.3 +,2 \$8+"6\$>".+&(*8,2 \$8\$0*2+E%\$, 6\$>\$%".(<4 6\$" 3 #%,*+,"(\$.7\$ +,2 5"\$
(\$6%&\$#,>E6*2.3 (* H&.3 +"4,0357*4 +,2 6\$+\$.6*2\$.+E 6\$" 3 (*+\$O,%& +,2 .* /F%,
\$#,>E6*2.34 *8+<4+34 SSG ID=,4 #*%")=\$(H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$+38,%>E
*56\$+&.+\$.3 +,2 \$8\$0*2+E%\$6\$>F4 6\$" ," *%5\$.7*4\$%/"6E4%1>("34, 0,6"(E4 6\$" >D.34
.* ="*"+,2%57\$,2 *R,#=".(,1 6\$" *6#\$70*2.34 #%,.:#"6,1 .

0EOIQAXFGIJEU?

2#,H%1/"4 \$8\$0*2+E%\$4 \$#,+*=*7 (" \$.+"H\$%E 20\$+,.*5E (,8&0\$ #,2
#*%")=\$(H&8*"+,8 6"83+E%\$ +38 #%,#D=\$ 6\$" +,8 *8.:(+\$:(D8, H%\$/7,8\$ 5"\$ +38
#%,.\$%(.5E +,2 \$8\$0*2+E%\$.* ,035< %&H0, \$8D=62.34 m\$.28,0*1*+\$" (* ,035<
\$8D=62.34 \$#< \$8,R*70:+, /&=2H\$ m\$ OD%""*#7.34 \$8,R*70:+3 \$=2.70\$ 6\$+&==3=,2
(E6,24 5"\$+38 \$8D=62.E+,2.

n., +, 028\$+<8#=3."D.+*%\$.* 6&>* \$8\$0*2+E%\$6\$".* *16,=\$ #%,H&."(, 6\$" (3
6\$+\$6=2M<(*8, .3(*7, >\$ *56\$+\$.+>*7 .+*5\$8< 62+7, 0"\$6=&0:.34 /.180*.34 +,2
+%,O,0,+ "6,1 6\$=:07,2 F.+* 8\$ *78\$""2/*%E43 \$#,(&6%28.E +,2.

\$@G[I?V@?TKL?O?[EMF`@SO

\$8\$0*2+E%\$4 #,2 #%,0"\$5%&O*+\$""0F #%D#*" 8\$ *78\$" ./*0"\$.(D8,4 6\$" 6\$+\$.6*2\$.
(D8,4 \$#< D8\$8 6\$+\$.6*2\$.+E , , ,#,7,4 >\$ D/*" +38 *2>183 5"\$ +,8
\$8\$0*%<(*8, *0F *R,#="(< +,2 \$8\$0*2+E%\$ 6\$+\$.6*2\$.+E4 #%D#*" 8\$ D/*" #*7%\$
#*"+2/3(D834="*"+,2%57\$5"\$+D+,"2 *70,24 \$8\$0*2+E%*4E 6&+"\$8&=,5, .+,8 70",+,(D\$ +,
="5<+*%2 /%<8"\$

\$8\$0*2+E%\$4#%D#*" 8\$ D/*" +38 "6\$8<+3+\$0"/7%".34\$6\$+D%5\$.+:8 =2(&+:8
(*+& \$#< #%,35,1(*8, *./\$%".(< .

P 0"&+\$R356\$+&.+\$.34 #%D#*" 8\$ *78\$"+D+,"\$F.+* 8\$ (38 /%*"&M*+\$"7.,0,4 +,2
#%,.:#"6,1 .+, 25%<O%*&+",E +38 0*R\$(*8E 6\$" F.+* 8\$ 0"*26,=18*+\$" 3 \$8D=62.3 6\$" 3
6\$>D=62.E+,2 \$8\$0*2+E%\$ \$8\$0*2+E%\$4\$.280D*+\$" 5"\$ +38 .+E%"RE,2 .* ,035<
%&H0,*=&/"34 0"\$+,(E4 50x50 mm. ;+,8 *R,#="(< +,2 \$8\$0*2+E%\$>\$ #*%")=\$(H&8*+\$
5" \$2+< D8\$6\$+&==3=, *2>28+E%",.1.+3(\$ 5"\$ +38 ,=7.>3.3 +,2 #&8: .+38 ,035<
%&H0,+, ,#,7, >\$ D/*" +38 028\$+<+3+\$,0E53.34 -,=7.>3.34 +,2 .28,="6,1 H&%,24+,2
\$8\$0*2+E%\$6\$">\$ *78\$""6\$8<8\$ #%\$%\$=\$(H&8*"+38 F>3.3 #,2 03("2%5*7\$2+<4

6"83+E%\$6\$"+, 6\$=F0", >\$ \$8+D/,28 .* .28*/E 2#,H%1/"\$ #%\$%\$(,8E /:%74 8\$
/&8,28 +38 20\$+,.*5\$8<+3+& +,24, \$6<(\$ 6\$".* H1>".3 H&>,24 (D/%"40 m.

B&>* \$8\$0*2+E%\$4>\$ *78\$" 2#,H%1/",2 +1#,2 6\$" >\$ *78\$" ./0"\$.(D8,4 F.+*
6"83+E%\$6\$" 20%\$2="6<D%,4(#+*%:+E) 8\$ *78\$",(\$R,8"6& .2M*25(D8," \$#,+*=F8+\$4 (7\$
(,8&0\$ (* 028\$+<+3+\$28*/14 =*"+,2%57\$4D.\$.+, %*2.+<

IS 61%"\$R\$%+E(\$+\$,2 \$8\$0*2+E%\$>\$ *78\$"#\$< /2+,.703%, ASTM 35B.n=\$ +\$
6+>*" (D8\$.+, %*2.+< #\$R"(&0"\$ H70*46\$" %,0D=*4>\$ *78\$"#\$< \$8,R*70:+, /&=2H\$
#%,0"\$5%\$OF&AISI 316L E 6\$=1+*%34#,"<+3+\$4

P \$%/E .+*5\$8,#,73.34 +:8 62%7:8 (*%F8 +,2 \$8\$0*2+E%\$>\$.+3%7M*+\$438
\$#*2>*7\$4 *\$#OE (3/\$8"6& 6\$+*%5\$.(D8:8 (*+\$=="6F8 *\$#"O\$8*"F8 B%7."(*4 (*+\$=="6D4
*\$#"O&8***4 <#,2 \$#\$"+*7+\$"20\$+,.+*5\$8<+3+\$ >\$ *78\$" (3/\$8"6& 6\$+*%5\$.(D8*4 6\$" .
.28\$%),(=,53(D8*4 (* .+*5\$8,#,"3+"6,14 0\$6+1=",24 \$#\$< Nitrile rubber E Viton
R\$.O\$=7M,8+\$4#%\$6E.2(#7.E +,24 . * 01, *#7#*0\$6\$"#\$#OE.* +D..*%\$.3(*7\$ /:%74
+38\$#\$7+3.3 *O\$%(.5E4 *8<4.256*6%"(D8,2 ,%7,2 %, #E4.

%>,5:8"6E4 0"\$+,(E4 O=&8+M*4 #,2 \$#\$"+,18 *"0"6E %, #E .+,%DU34 E
.+*5\$8,#,"3+"6D4 ,2.7*4 0*8 >\$ 578,8+\$" \$#,0*6+D4 S#7.34 0*8 >\$ #D#*" 8\$
/%3."(,#,"18+\$" &==*4 0*2+*%*1,2.*4 .+*5\$8,#,"3+"6D4 ,2.7*4, *=="#+"6& O-rings E
5%&... .

" 6"83+E%*4\$ *78\$"6\$+&==3=\$0"\$+\$.",=,53(D8," F.+* 3 U1R38\$ *\$"+25/&8*+\$"
(* +38 \$#\$5:5E >%(<+3+\$4 \$#\$< +, #*%"H&==,8%*2.+< P 1#%\$R320%,/"+:87,2 E
R:+%"6,1 .2.+E(\$+,4 U1R340*8 \$#\$"+*7+\$"

P *7.,0,4 +,2 6\$=:07,2 >\$ #D#*"8\$ \$#,+*=*7 +(E(\$ +,2 .F(\$+,4 +,2
6\$=1((\$+,4 +,2 .+&+,%\$. ./0"\$.(<4 +,2 .+2#">=7#+3 *".<0,2 6\$=:07,2 >\$ #D#*"8\$
*R\$.O\$=7M*20\$+,.+*5\$8<+3+\$ /:%74 8\$ /%*"&M*+\$""0"6E.1.O"5R3 (* .256*6%"(D83%, #E
.+,%DU*:4. P *7.,0,4 +,2 6\$=:07,2 >\$ \$#,+*=*7+\$"#\$< D8\$62="80%"6\$=\$.+*6< 0\$6+1=",
#=\$".":(D8, \$#\$< 01, %,0D=*46\$" <=\$ (\$M7>\$ *78\$".28\$%),(=,53(D8\$ (* \$6%7H*" \$ #%,4
+38*R:+*%"6E0"&(*+%, +,2 6\$=:07,2 . P .2(#7*.3 +,2 *=\$.+*6,1 #%\$*(H1.(\$+,4 >\$ 578*+\$"
(* +%<#,#,2 >\$ \$2+\$\$.O\$=7M*+\$* +2/<8 +%&H35(\$+,2 6\$=:07,2 .

>&=\$(.4 .280D.*:8 +:8 6\$=:07:8 6\$" , >&=\$(.4 +,2 6"83+E%\$>\$ #D#*"8\$
0"\$/:%7M,8+\$"#\$< +38 .**%& \$6%,0*6+F8 F.+* 8\$ #%,..+*\$+*1*+\$" , 6"83+E%\$4\$#< +38
*7.,0, RD8:82="6F8#,2 +2/<8 8\$ *".D=>,28 \$#\$< +386,%2OE+,2 \$8\$0*2+E%\$P .**%&+:8
\$6%,0*6+F8>\$ #D#*"8\$ 0"\$/:%7M*+\$"+*5\$8& \$#\$< +,8 >&=\$(. +,2 .+&+,%\$ (* +38 /%E.3
01, .+*5\$8,#,"3+"6F8 0\$6+2=7:8 O-ring.

Z"\$+\$ 6\$=F0"\$ /1,4 #D#*"8\$ /%3."(,#,"18+\$" (<8, *"0"6,7\$6%,0D6+*46,"8,7
\$6%,0D6+*4E +\$/2.180*.(, 0*8 *\$"+%D#,8+\$"

S#,R"6D42.7*4 6\$" &== \$0*2+*%*1,8+\$.2.+E(\$+\$.+*5\$8,#,73.34 0*8 >\$ 578,8+\$"
\$#,0*6+& (H,2=6\$8".(<4, ."="6<8*46.=.#.).

6"83+E%\$4\$ *78\$".280*0*(D8,4 (* +38 #%,#D=\$(D.: 6"H:+7,2 (*+&0,.34 .
6"83+E%\$4,2 \$8\$0*2+E%\$>\$ *78\$".15/%,8,4]S4 , (<8"(34 (\$58E+ ".34 , +, #,>*+3(D8,4
(D.\$. * 6D=2O,4(#*%7H=3(\$, >&=\$(,4 +,2 ,#,7,2 >\$ *78\$ "20\$+,.+*5E4. I\$ +2=75(\$+\$
+,2 .+&+,%\$ >\$ *78\$ "(,8:(D8\$ (* (<8:.3 (6=&.34 +,2=&/" .+,8 H) \$8>*6+"6E+38 25%\$.7\$
6\$ "2#,,5".(D83 5"\$180s C.

6"83+E%\$4\$ *78\$ " ./*0"\$.(D8,4 5"\$.28*/E =" +,2%57\$ \$8&0*2.34 %*2.+F8
>*(,6%\$.7\$4(D/% " 40' C 6\$ "5"\$60 *66"8E. "*"4+38 F%\$ m\$ 0"\$>D+*">*("6,14 0"\$6<#+*4
%2>(".(D8,24 8\$ \$8,75,28 .+,24 125' C 6\$ " 8\$ 6=*78,28 .+,24 70, C, #,2 >\$ *78\$ "
+, #,>*+3(D8, " (D.\$.+\$ +2=75(\$+\$ +:8 \$5:5F8 +,2 .+&+,%\$ F.+* 8\$ *=D5/,28 +3
>*(,6%\$.7\$ 6&>* O&.34 +,2 +2=75(\$+,4 K2+,7 , " 0"\$6<#+*4>\$ /%3."(, #, "18+\$ " . *
.2802\$.(< E .2(#=3%:(+\$+"6& . * *R:+"%"6E#%,.+\$.7\$ +,2 6"83+E%\$ \$#< 2#*%O<%"+" .36\$ "
>\$.280D,8+\$ " .+,8 #78\$6\$*=D5/,2.

6"83+E%\$4\$, \$8\$0*2+E%\$4\$ *78\$ " ./*0"\$.(D8, " 6\$ " .28\$%(,=,53(D8, " \$#< +,8
70",6\$+\$.6*2\$.+E . O 6"83+E%\$4\$ OD%**8.:(\$+: (D8, inverter.

#78\$6\$4+,2 6"83+E%\$ \$,2 >\$ #\$\$\$0,>*7 >\$ #%D#*"8\$ #*%"=(H&8*"+4 *RE4
6\$ (#1=*4 =" +,2%57\$4%,#E4 .+%DU*:4, 3=*6+%"6E4D8+\$.34 .28+*=* .+E " ./.1,4 , H\$>,(1
\$#<0,.34 \$8\$02<(*834 " ./.1,4 6\$>F4 6\$ " " ./.1,4 *".<0,2 6\$ " .+,8 &R,8\$ #78\$6\$4\$2+<4
>\$ #%D#*"8\$ #*%"D/*"6\$ " 0*0,(D8\$ 5"\$+38 .2(#*%"O,%& +,2 6"83+E%\$ \$&+: \$#< .28>E6*4
*66783.34E =" +,2%57\$4%74 O,%+7,

n &R,8\$4 +,2 \$8\$0*2+E%\$ /6"83+E%\$>\$ *0%&M*+\$H&.*" +,2 6\$8<8\$.+\$>*%E4
#=:+E4 D0%\$.34.* +%"H*741=" .34, " ,#,7," >\$ 0"\$>D+,28=7#\$8.35"\$ <=3 +3 0"&%6*" \$-34
M:E4+,24. I, *:+"%"6< D0%\$8,>\$ \$#,+*=*7+\$ "\$#< D8\$8(,8E4 .*" %&462="80%"6<%"HD\$
D8\$8 (,8E4 .*" %&4 5:8"\$6E4 *#\$OE4 D8.O\$"% , +%"HD\$ "\$ +38 #\$\$\$=\$HE\$R,8"6F8 6\$ "
\$6+"8"6F8O,%+7:8 I, 61%", D0%\$8,>\$ \$#,+*=*7+\$ "\$#< D8\$85:8"\$6E4 *#\$OE4 D8.O\$"% ,
+%"HD\$,2 >\$ #\$\$\$=\$ (H&8*\$R,8"6&O,%+7\$

B&>* \$8\$0*2+E%\$4>\$ *78\$ " *O,0"\$.(D8,4 (* >&=\$(, *= \$7,2 5"\$ +, .1.+3(\$
 .+*5\$8,#,73.34 +,2 &R,8\$ " +&#*4 *# ">F%3.34 +,2 =\$0",1 >\$ *78\$ "#%,." +D4 \$#< +,
*R:+"%"6<(D%,4+,2 \$8\$0*2+E%\$

B&>* \$8\$0*2+E%\$4>\$ *78\$ " *O,0"\$.(D8,4 (* D8\$ *8 .*" %& (3/\$8"6< .1.+3(\$
 .+*5\$8<+3+\$4&R,8\$ \$#,+*=,1(*8, \$#< 01, \$8*R&%+3+256%,+E(\$+\$.+2#",>=" #+F8.

6&+: #%:+*1:8 .+2#",>=7#+34 >\$ #D#*8\$ *78\$"+,#,>+3(D8,4 \$8&(*.\$.+,
\$8\$("582<(*8, %*2.+< 6\$".+, *\$=",0,/7, 6\$">\$ #D/*" D8\$.+#+6< 6\$" D8\$
#*%".+%O<(*8, 0\$6+1=", .+*5\$8<+3+\$4\$#< 6\$%H70"+,2 H,=O%\$(7,2

&8: 0*2+*%*1:8 .+2#",>=7#+34 +,#,>+3(D8,4 (*+\$R1 +,2 0,/7,2 =\$0",1 6\$"
+,2 #*%"H=E(\$+,4+,2 6"83+E%\$>\$ #*%"D/*"D8\$.+#+6< 0\$6+1=", 6\$" D8\$#*%".+%O<(*8,
0\$6+1=", .+*5\$8<+3+\$4\$#< 6\$%H70"+,2 H,=O%\$(7,2 P *\$OE +:8 =*\$.(D8:8 *#"O\$8*"F8
. * 6&>* .3(*7, .+*5\$8<+3+\$4 >\$ *#" +25/&8*+\$" (* 0"6< +,2 .1.+3(\$ *\$=+3%7:8 "
.+2#",>=7#+*40*8 >\$ \$\$\$\$"+,18 .28+E%3.3 6\$"%1>("3 6\$">\$ #D#*8\$ =*"+,2%5,18/:%74
6\$+\$.+%,OE +,24 E H=&H3+,24 6\$+&,#,"\$0E#,* O,%&#*%".+%,OE4(6\$+&+38 O,%&+:8
0*"6+F8+,2 %, =,5",1 E 6\$+&+38 \$8+7>*+ß

t==*4 (D>,0," .+*5\$8,#,73.34 0*8 >\$ >*:%,18+\$" ".,018\$(*4 6\$" 0*8 >\$ 578,8+\$"
\$#,0*6+D4

&R,8\$4 +34 #+*%:+E4 >\$ \$#+*=%7 #%,D6+\$.3 +,2 &R,8\$ +,2 6"83+E%\$70",4
&R,8\$4. V1, 0"\$O,%*+"6,7&R,8*4.2M*25(D8," (* .180*.(, 0*8 >\$ 578,8+\$"\$#,0*6+,7.
&R,8\$4>\$ *78\$"\$#< \$8,R*70:+, /&=2H\$ 6\$+&AISI 431. H /%E.3 \$8,R*70:+:8 /"+:87:8 0*8
>\$ >*:%*7+\$"".,018\$(3 (* +38/%E.3 &R,8\$#\$< \$8,R*70:+, /&=2H\$.

P #%,#D=\$>\$ #D#*8\$ *78\$"028\$("6& M25,.+>(".(D83 , (* +D+,"\$0\$(<%O:.3 .+\$
#+*%15"\$back swept) F.+* 8\$ \$#,O*15*+\$" 3 D(O%\$R\$"+, (#=,6&%".(& +34 m\$ #D#*"
8\$ *78\$""6\$8E8\$ /"%7M*+\$*%*&, "8F03 E (\$6%<"8\$2="6& #\$/"& =&.#3 6\$"&==2="6&+\$
#,7\$.28\$8+F8+\$" . * .28E>34 *O%\$(,5D4 *#*R*%5\$.7\$4=2(&+:8 . m\$ \$#,+*=%7+\$"\$#< 3
#+*%15"\$* 0"&(*+%, p 550 mm. P #%,#D=\$>\$ #D#*8\$ *78\$"\$#< \$8,R*70:+, \$+.&=" AISI
316L.

n=," , " 6"83+E%*4\$ D/,28:

- m*%("6,140"\$6<#+*4., +1="5(\$6&>* O&.34 , .280*0*(D8,24 . * ."%&
- K".>3+E%",25%\$.7\$4+, >&=\$(\$, +,2 .+&+,%\$
- A%,.+\$.7\$ \$#\$< 2#*%D8+\$.3
- A%,.+\$.7\$ \$#\$< 2#*%>D%(\$8.3
- A%,.+\$.7\$ \$#\$< 2#D%+\$.3 2#<+\$.3 , \$F#="\$ O&.34

I, 0,/7, =\$0",1 >\$ \$#+*=%7+\$"\$#< 01, (D%3 D8\$*.:+*%"6< 6\$" D8\$*R:~*%"6<.
;+38 #*%7#+:3 #,2 +, \$8\$0*2<(*8, %*2.+< #*%&.*" +,8 *R:~*%"6< .+2#",>=7#++3 ,
./0"\$.(<4 \$2+<4 *#"~%D#*"+, *R:~*%"6< (D%,4 8\$.256%\$+E.*" +\$ H\$%1+*%\$6\$"
#268<+*%\$%*2.+&\$#=&6\$"(<8, (* +38 H,E>*"\$ +34 H\$%1+3+\$4

"I[IQKL ?N?IF`XEIL VI? FGML?O?[EMF`@EL

6"83+E%\$4\$ *8.:(+\$F8*" .1.+3(\$ *=D5/,2 (* %2>(" .+E .+%,OF8 (inverter),
"07,26\$+\$.6*2\$.+E (* +38 \$8+=7\$(* +"4#\$\$%\$6&+: 028\$+<+3+*4

- +3=*0"\$/*7%".3(D.: 3=*6+%,8"6,1*=D5/,2 (gateway)
- ,(\$=E *66783.3 (* D=*5/, %, #E46\$" \$8+7.+,"/, .+\$(&+3(\$
- D=*5/,4 O, %&4 #*%".+%,OE46\$" #"H*H\$7:.3 ,%><+3+\$4(\$#,O25E (<8"(34
\$8&.+%,O34=*"+,2%57\$4
- \$8\$.+%,OE =*"+,2%57\$4* #*%7#+: .3 (#=,6\$%7.(\$+,4 +34 #+*%:+E4 6\$" *
*\$8\$O,%&
- #%,.\$%(,5E .+%,OF8 .+38 #*%7#+: .3 2#*%>D%(\$8.34D:4 <+,2 *#\$8D%>*,"
6"83+E%\$4+38 O2." ,=,5"6E >*(,6%\$.7\$ 6\$>".+F8+\$4 +38 \$#\$7+3.3 . *
R:+%"6&>*(("6&R*#*%\$. (D83

P 3=*6+%,8"6E,8&0\$ *=D5/,2 (gateway) >\$ D/*" +\$ *RE4/\$%\$6+3%".+"6&

- I%,O,0,.7\$ 24 V DC
- m1%*4 USB , RS485 , ETHERNET RJ45
- A%:+<6,== \$ *#"6,"8:87\$4 0"*>8F4 \$8\$58:%". (D8, #%:+<6,==, bus
- I/O DOx4 , Dix4 , Alx1 , AOx1

P 3=*6+%,8"6E,8&0\$ >\$ *R\$.O\$=7M*!,8 #=E%3D=*5/, +34 \$8+=7\$4\$6<(\$ 6\$" .+38
#*%7#+: .3 \$.+/,7\$4 +34 61%"\$4cpu, (D.: %*=D=*"+,2%57\$4m\$ #*%")= \$(H&8*+\$!,8&0\$
/*"%".(,1 & \$#"6<8".34(HMI unit) (* :

- K#"6<8".3 2U3=E4>*(,6%\$.7\$4
- K#"6<8".3 0"\$%%,E25%,1 .+,8 .+&+3
- K#"6<8".3 2U3=E4.+&>(34
- K#"6<8".3 .O&=(\$+,4 transducer
- K#"6<8".3 2#*%D8+\$.34
- K#"6<8".3 2#<+\$.34/2#D%+\$.34
- V28\$+<+3+\$%1>(" .34 #\$\$\$(D+:%:8(D.: 6\$>,0E53.34

P (,8&0\$ \$#"6<8".34 (#,%*7 8\$ *78\$" .280*0*(D83 (* #*%"..<+%,24 +,2 *8<4
\$8\$0*2+E%*4*O<.,8 D/*" +D+,"\$028\$+<+3+\$

OFYUEL:MCAFSO

OFIQEUCEOG

KO,%&+38 \$8+"6\$+&+.3 2O".+&(*8:8 \$8+= "F8(* 8D*4E \$\$/ "6E*56\$+&+.3 8D:8 \$8+= "F8 #,2 D/,28 +,2=&/" .+,8 +\$ =*" +,2%5"6&/\$%\$6+3%".+"6&#,2 \$8\$OD%,8+\$".+,8 .28,#+"6< #78\$6\$ *R,#=".(,1 . P #,\$%,1.\$ \$O,%& (<8,8 +"4 \$8+=7*4\$8\$626=,O,%7\$4 \$8&("6+,2 25%,1 6\$" +"4\$8+=7*4+,2 \$8+=",.+\$.7,2 "=1,4 (\$8\$626=,O,%7\$46\$" \$#<%%"U34 Z"\$+"42#<=,"#*4 \$8+=7*4./1,28 , " Z*8"6D4%,0"\$5%\$OD4

S6+<4 \$#< +38 #=E%3 *56\$+&+.3 +:8 8D:8 \$8+= "F8 #*%"= \$(H&8*+\$"6\$" 3 \$8+"6\$+&+.3 +,2 +%,O,0,+"6,1 6\$=:07,2 6\$" +,2 6\$=:07,2 .3(&+:8 6&>* \$8+=7\$4D/%" +,8 #78\$6\$+%,O,0,.7\$4 6\$" 3 *56\$+&+.3 .+*5\$8,1 62+7,2 0"\$6=&0:.34 /.180*.34 +:8 #%, \$8\$O*%>D8+:86\$=:07:8 #=3.7,8 +34 \$8+=7\$4A*%"= \$(H&8*+\$*#7.34 3 \$\$(,(&6%28.3 +34 \$8+"6\$>".+&(*834\$8+=7\$4, 6\$>\$%".(<4 6\$" 3 #%,*+,"(\$.7\$ +345"\$ (\$6%&\$#,>E6*2.3 (* H&.3 +"4,0357*4+,2 6\$+\$.6*2\$.+E 6\$" 3 (*+\$O,%& +34.* /F%, \$#,>E6*2.34 *8+<4+34 SSG ID=,4 #*%"= \$(H&8*+\$"6&>* 2="6< 6\$" ("6%,X="6<5"\$ +38 ,%>E *56\$+&+.3 +34 \$8+=7\$46\$>F4 6\$" , " %5\$.7*4 \$\$/ "6E4%1>(" .34, 0,6"(E4 6\$" >D.34 . * =*" +,2%57\$+,2 *R,#=".(,1 6\$" *6#\$70*2.34 #%,..#"6,1 .

OEIOQAXFGIJEU?

" \$8+=7*4>\$ *78\$" *R="5(D8,2 +1#,2 (* *8.:(+\$:(D8, inverter (+,2 "07,2 6\$+\$.6*2\$.+E (* +38 \$8+=7\$ 6\$" **0"6E.2.6*2E (gateway) *#6,"8:87\$4 (* +, .1.+3(\$ \$2+,\$+").(F8 , .+,8 #78\$6\$ +%,O,0,.7\$4. P 6&>* \$8+=7\$>\$ D/*" 028\$+<+3+\$ #%, - #%,5%\$(((\$+").(,1 +34 6\$(#1=34 =*" +,2%57\$4 6\$" 028\$+<+3+\$ 0"*8D%5*"4616=:8 \$8+7.+%,O34#*%".+%,OE45"\$ &% .3 +2/<8 *(#=.6F8 (* &(*., D=*5/, 6\$" (D+%3.3 +34 %, #E4 ?* +38 *R="5(D83\$2+E +*/8,=,57\$, ,(&0*4 \$8+= "F8>\$ D/,28 +, 70",20%\$2="6<6\$" 3=*6+% "6<D%,4 6\$" , " *#0<.*"4 +,24 . * 6&>* *O\$%(.5E >\$ 6\$>,%7M,8+\$"+3 O&.3 +,2 #%, - #%,5%\$(((\$+").(,1 (* #%,O\$8E #=* ,8*6+E(\$+\$.+3 .28+E%3.3, 0"\$/*7%".3 \$8+\$==6\$+"6F6\$" *8\$==R"(<+3+\$:8 \$8+= "F8

Z"\$ \$2R3(D83\$8+,/E . * (3/\$8"6E O>,%& 6\$" 0"&H%:.3, 3 #+*%:+E >\$ *78\$" \$#< .6=3%2(D8, /2+,/&=2H\$ 2U3=E4\$8+,/E4

\$@G[I?V@?TKL?OFYIRO

" \$8+=7*4>\$ *78\$" O25,6*8+% "6D42#,H%1/"*4 6\$+&==3=*45"\$ =1(\$+\$, 6\$" 5"\$.28*/E =*"+,2%57\$6&+: \$#< .28>E6*4 #=E%,24 E (*"6E4*(H&#+" .34. " 6\$(#1=*4 +:8 \$8+= "F8>\$ #=3%,18+"4\$#\$"+E. "*"4+,2 #%,+1#,2 ISO EN 9906A\$%&%&K.

P *#"=,5E +34\$8+=7\$4\$ #D#*8\$ 578*(" H\$. "6< 6%" +E%\$,8 H\$>(< \$#<0,.34 .

Z"\$ \$2R3(D83\$8+,/E . * (3/\$8"6E O>,%& 6\$" 0"&H%:.3, 3 #+*%:+E >\$ *78"\$#\$< .6=3%2(D8, /2+/,&=2H\$ 2U3=E4\$8+,/E4, 2U3=E46%\$(+&:.34 +34 +&R34+,2 25% . * Cr 6\$" #*%"*6+"6<+3+\$ C +34 +&R34+,2 3%. B\$+&+3 O&.3 +34 .+*%*,#73.34 , Cr 6\$" C (*+\$. /3(\$+7M,8+\$" . * 6\$%H70"\$R\$"%"*+"6&2U3=E4.6=3%<+3+\$4 P *#"O\$8*\$6E.6=3%<+3+\$ +34 #+*%:+E4>\$ *78\$"+,2=&/" .+,8 HRC 60 (Rockwell Hardness6\$+&+3 (D>,0, (D+%3.34 C).

P #+*%:+E >\$ *78\$" 20%,028\$("6& M25,+\$>(".(D83 , /:%74 ,R*7*4 .+%,OD4 \$8*(#<0".+34 %,E4 (/:%74 *(O%&R*)"4 5"\$,(\$=E 07,0, .O\$%" "6F8.+*%*F8 +34 (D5".+34 028\$+E40"\$ (D+%,2 P #+*%:+E >\$ (#,%*7 8\$ /%3."(,#"*7+\$" 5"\$ +38 &8+=3.3 25%F8#,2 #*%"D/,28 .+*%*& \$#<H=3+\$ "8F03 2="6& 6\$" &==*4 1=*4 #,2 #*%"D/,8+\$" . * .28E>3 \$6&>\$%+\$B*%& (=1(\$+\$).

P #+*%:+E (#,%*7 8\$ *78\$"7*+*3("\$8,"6+,1 +1#,2 *7*+*6=*".+,1 +1#,2, (* #=E%3 #+*%15"\$full vaned), +1#,2 6\$8\$=" ,1, (,8,6&8\$=3 E ,="5,6&8\$=3 *7*+*1#,2 vortex (open impeller), <#,+* \$2+< *78\$"028\$+<F.+* , 20%\$2="6<#I\$>(<4\$#<0,.34 8\$ *78\$"2U3=<4

P #+*%:+E >\$ #D#*8\$ *78\$"+\$+"6& 6\$" 028\$("6& M25,+\$>(".(D83 , .+*%*:(D83 .+,8 &R,8\$ (* \$.O\$=E +%<#, #,2 >\$ *#"+"D#*"+38 *16,=3 \$#, .28\$%,(=<53.3 . * #*%7#+: .3 .28+E%3.34. &R,8\$4>\$ *78"\$#\$< \$8,R*70:+, /&=2H\$, #,"<+3+\$4DIN 1.4021 (AISI 420) E 6\$=1+*%34

" +%"H*74\$ *78\$"#\$%6F45%\$..\$%".(D8," *O' <%,2 M:E4 6\$" 2#,,5".(D8," 5"\$.28*/E =*"+,2%57\$0.000 :%F8 , 6\$+&ISO 281.

H \$8+=7\$>\$ *78\$"O,0"\$.(D83 (* D8\$(3/\$8"6< .1.+3(\$.+*5\$8,#73.34 &R,8\$ +, #,7, >\$ \$#,+*=*7+\$"#\$< 01, (3/\$8"6,14 .+2#" ,>=7#+*4 . * .*"%& (&8: 6\$" 6&+:) *7*+*>\$ *78\$" *O,0"\$.(D83 (* D8\$ *8"\$7, (#=<6 #,2 >\$ #*%"= \$(H&8*"+,24 01, (3/\$8"6,14 .+2#" ,>=7#+*4 0"\$+*+\$5(D8,24 *8 .*"%& *56"H:+".(D8,24 . * 6=*".+< .:=38,"0D4 #%,.+*+*2+"6< 6"HF+", \$#< \$8,R*70:+, /&=2H\$ " (3/\$8"6,7 .+2#" ,>=7#+*4 . * 6&>* #*%7#+: .3 >\$ *78\$" 01, 6\$" >\$ =*"+,2%5,18 \$8*R&%+3+\$, D8\$4 \$#< +,8 &==,, \$#, (,8F8,8+\$4 +,8 6"83+E%\$#\$< +, 20%\$2="6<(E(\$ +34\$8+=7\$4

P \$8+=7\$ #D#*" 8\$ *78\$" *O,0"\$.(D83 >&=\$ (, =0",1 5"\$ +, .1.+3(\$.+*5\$8,#73.34 +,2 &R,8\$ " +&#*4 *#">*F%3.34 +,2 =0",1 >\$ *78\$"#\$,. "+D4\$#\$< +,

*R:+"%6<(D%,4 +34 \$8+=7\$4I, =&0" +,2 .2.+E(\$+,4 .+*5\$8,#,73.34 0*8 >\$ #*%"D/*"
626="6,1420%,5,8&8>%"\$6*46\$" >\$ *78\$""56*6%"(D8,\$#< +, FDA E &==, 0"*>8E,%5\$8".(<.
I, =&0">\$ (#,%*7 8\$ ="#\$78**"#7.34 6\$" +,24 .+2#",>=7#+*4 6"83+E%\$4\$ (#,%*7 8\$
="",2%5E.*"5"\$,%".(D8, /%,8"6< 0"&.+3(\$ /:%74 =&0", /:%74 8\$ #%,6\$=*7+\$H=&H3+,24
.+2#",>=7#+*4

6"83+E%\$4\$ *78\$".15/%,8,4 , 6=&.34 \$#<0,.34 JS4, *0%\$M<(*8,4.+38 6*O\$=E
+,2 \$8+=3+"6,1 .256%,+E(\$+,4 6\$" *8.:(\$+: (D8,4 .+, 70", 6D=2O,4 (* +38 \$8+=7\$
Z78,8+\$" 0*6+,7 6\$" \$.15/%,8," 6"83+E%*4H%\$/2626=: (D8,2 0%,(D:4 (* 028\$+<+3+\$
+,2=&/" .+,8 100 *66"8E.*:8 /F%\$.2/8<+3+\$ #,2 \$#\$"+*7+\$5"\$ +38 *#7+*2R3+:8 616=:8
\$#*(#=:6E4. P 6=&.3 (<8:.34 >\$ *78\$"+,2=&/" .+,8 P (\$8+,/E 180°C) 6\$" , H\$>(<4
#%,.+\$7\$4 IP 68.

" 6"83+E%*4:8 \$8+=F8>\$ *78\$""#\$8\$#*%"*=7R"(/:%74 8\$ *78\$".28+35(D8," .
%3+783 (* +, .1%(\$ #*%"D="R38\$ #%,.++\$*1*+" \$#\$< \$0"&H%,/, #"6&=2U3 6\$" >\$
0"\$>D+,28\$".>3+E%"\$87/8*2.34 >*(,6%\$.7\$4.* 6&>* O&.3 5"\$ +38 #%,.+\$7\$ \$#\$< +38
2#*%>D%(\$8.3 P \$8+=7\$>\$ #D#*8\$ 0"\$>D+*"\$".>3+E%\$5"\$ +38 \$87/8*2.3 #">\$8E4
0"\$%\$,E46\$" . * #*%7#+:3 \$87/8*2.34 25%\$.7\$4, 6"83+E%\$8\$ +7>*+\$*6+<4="",2%57\$4
6\$"/E 8\$ *8*%5,#,"*7+\$".28\$5*%(<4. P \$8+=7\$>\$ #D#*8\$.28,0*1*+" \$#\$< +\$ 3=*6+%,8"6&
.2.+E(\$+\$ +,2 6\$+\$.6*2\$+E .+\$,#7\$ >\$.280D,8+\$" <=\$+\$\$.>3+E%"\$

I\$ 6\$=F0"\$ >\$ \$#,+*=,18+\$" \$#\$< *16\$(#+,24 /&=6"8,24 \$5:5,14 660/1000 Volt
(,8:(D8,24 6\$" #*802(D8,24 (* (<8:.3 6\$+&==3=35"\$ 2#,H%1/"\$ /%E.3. m\$ *78\$"
\$":%,1(*8\$, *#%\$6,14 (E6,24 , F.+* 8\$ *6+*78,8+\$" \$#\$< +, 6,2+7 0"\$6=&0:.34 (D/%" +,
6,2+7 .180*.34 .+,8 6"83+E%\$I, (E6,4 +:8 6\$=:07:8 >\$ *78\$"+D+," , F.+* 8\$ 2#&%/**
#%\$6D41%,4 \$#\$< +38 &8: .+&>(3 .62%,0D(\$+,4 +,2 O%\$+7,2 I\$ 6\$=F0"\$ #D#*8\$
*78\$" (,8,6<((+\$ \$ #%,4 +,24 3=*6+%"6,14 #78\$6*4 6\$" 8\$ \$#,O*15,8+\$" , 2#\$7>%"*4
.2M*1R**4 n#,2 \$2+D4*78\$"\$8\$#<O*26+*4 #D#*8\$ *78\$"6\$+&==3=*45"\$ =*",2%57\$*
.28>E6*4 6\$+\$5".(,1 8*%,1 (IP 65).

I, 6"HF+",.180*.34 +:8 6\$=:07:8 #D#*8\$ *78\$",=,6=3%:+"6& .O%\$5".(D8,, (*
.+2#",>=7#+3 #,2 >\$ *(#07M**"+34*7.,0, 25%,1 E 25%\$.7\$4

n+\$8 3 \$8+=7\$>\$ =*",2%5*7.28*/F4 6\$=2((D83 *R ,=,6=E%,2 \$#\$< +38 .+&>(3
=2(&+:8 , \$6<(3 6\$" .+38 /\$(3=<+*%3 .+&>(3 +,2 \$8+=",.+\$7,2 , , 6"83+E%\$4\$ U1/*+"\$
\$#\$< +, #*%"H&==,8%*2.+< A%,6**"(D8,2 5"\$ \$8+=7\$R3%E456\$+&+\$.34 E 5"\$ \$8+=7\$25%E4
56\$+&+\$.34 #,2 =",2%5*#*%"0"6&*6+<425%,1 (.+38 /\$(3=<+*%3 .+&>(3 , 6"83+E%\$4
E (D%,4 +,2 \$#,6\$=1#+*+"\$), 3 U1R3+,2 6"83+E%\$ \$ #D#*8\$ 578*+"\$(* D8\$.1.+3(\$
8%5E4U1R34 #,2 >\$ #*%"=(H&8**%(3+"6&6=" .+< 6\$" \$8*R&+3+,616=:(\$ (\$801\$

U1R34 (* 25%< (75(\$ 8*%,1-5=26<=34 E &==, 6\$+&==3=, U26+"6< (D., , #+*%:+E
\$8\$626=,O,%7\$4 +,2 U26+"6,1 6\$" *8\$==&6+3 >*(<+3+\$4 #,2 >\$ U1/*+\$" \$#< +,
\$8+=,1(*8, 25%< S8\$==6+"6& 6"83+E%\$4\$ H%7.6*+\$" * >&=\$(, #=3%:(D8, (* **0"6<
"\$+% "6U26+"6<=&0"(medical white oil) +, #,7, >\$ 626=,O,%*7.* 6="".+< 616=:((\$ #,2 >\$
#*%"=(H&8**8\$==&6+3 ;* \$8+=7*4* (D5*>,4 (*5\$=1+*%, \$#< DN 80, 3 \$8\$626=,O,%7\$
+,2 U26+"6,1=\$0",1 >\$ *78\$*R\$8\$56\$. (D83

; * 6&>* #*%7#+:1.3 +, .1.+3(\$ U1R34>\$ #D#*8\$ *\$%6*75"\$.28*/E ="",2%57\$
+34\$8+=7\$4* #*%"H&==,8+\$F%, >*(,6%\$.7\$4(D/%"40°C. ;1.+3(\$ (* /"+F8", U1R34.,
#,7, >\$ \$8\$626=,O,%*7+, \$8+=,1(*8, =1(\$:4 U26+"6<(D.,8 , 0*8 >\$ 578*+\$#\$,0*6+<.
;* #*%7#+:1.3 #,2 /%3."(, #,3>,18 6"83+E%*4U3=E4 \$#<0,34 //\$(3=F8 \$#:=**F8 (*
+2=75(\$+\$.15/%,8,2 6\$" </" \$.15/%,8,2 +1#2, *78\$" \$#,0*6+< 3 U1R3 +,24 8\$
#"+25/&8+\$" (* (*+&0,3 >*(<+3+\$4(* \$5:5"(<+3+\$ #%,4 +, 20%\$2="6<+(E(\$ (D.:
**0"6&./0"\$.(D8,2 *2>*((\$5:5,1 6*=1O,24 6\$"6\$+<#"8(* .28\$5:5E #%,4 +, \$8+=,1(*8,
%*2.+< l, .1.+3(\$ U1R34#D#*8\$ #D/*" *\$%6E U1R3 . * .28*/E ="",2%57\$+34
\$8+=7\$4\$1) (* >*(,6%\$.7\$4\$8+=,1(*8,2 %*2.+1 (D/%"40 oC.

IS 6*=1O3 +34 \$8+=7\$46\$" +,2 6"83+E%\$(8*R&%+3+\$2M*25(D8\$ (* .+*5\$8E
N=&8+M\$6\$" +\$ 61%"\$R\$%+E(\$+\$34\$8+=7\$4\$ *78\$"#\$< O\$" </2+,703%, (grey cast iron)
E *=\$+< .O\$"%,**0E /2+,703%, #%,0"\$5%\$OF86\$+& DIN GG20 (EN-GJL-200), GG25 (EN-
GJL-250) E GGG50.7 (EN-GJS-500.7)(* =7*4*#"O&8***4*=*1>*%*4\$#< O2.\$=70*4E &==*4
\$8:(\$=7*4. n=\$ +\$ *6+*>*(D8\$ #R"(&0"\$ H70*46\$" %0D=*4>\$ *78\$"#\$< \$8,R*70:+,
/&=2H\$, #%,0"\$5%\$OF8AISI 316 (DIN 1.4401), ASTM A 276/A 182, E 316 Gr F 316 E
6\$=1+*%34#,"<+3+\$4

l, 6D=2O,4 +,2 6"83+E%\$#D#*8\$ 0"\$>D+*"6\$+&==3=*42#0,/D4 *8"\$7*4(* +,
.F(\$ +34 \$8+=7\$45"\$ +38 \$81U:1.3 +34 \$8+=7\$4 +,24 ,#,7,24 >\$.280D*+\$" (<8"(\$
\$8,R*70:+3 \$=2.70\$E .2%(\$+<./,8, . * #%,.#*=&."(, .3(*7, .

B%7."(*4(*+==\$ "6D4*#"O&8***4<#2 \$#\$"+*7+\$20\$+,+*5\$8<+3+\$ >\$ *78\$"(3/\$8"6&
6\$+*%5\$. (D8*46\$" .28\$%(,=,53(D8*4 (* .+*5\$8,#,"3+"6,14 0\$6+1=",24 P .28\$%(,5E +,24
>\$ *#"+25/&8*+\$" (* *=*5/<(*83 *\$OE 6\$" .2(#7*.3 +:8 .+*5\$8,#,"3+"6F8 0\$6+1=":8 6\$"
."4 +D..*%"4 #=*2%D4+34 \$1=\$6&4+,24, /:%74 8\$ \$#\$"+*7+\$**0"6E %,#E .+E%"R34+,24
6,/=7*4 #,2 \$.O\$=7M,28+3 .28\$%(,5E . %>,5:8"6E4 0"\$+, (E4 O=&8+M,*4#2 \$#\$"+,18
**0"6E%,#E .+%DU34E .+*5\$8,#,"3+"6D4,2.7*4 0*8 >\$ 578,8+\$#\$,0*6+D4

H \$8+=7\$#D#*8\$ 0"\$>D+*",035,14 \$8D=62.34\$#< \$8,R*70:+, /&=2H\$ AISI 304 E
316. " ,035,7 >\$ *78\$5*%&.+*%*: (D8," (D/%" +, &8,"5(\$ *#7.6*U34 +,2 O%*\$+7,2 H
\$8+=7\$>\$ (#,%*7 8\$ \$82U:>*7 DR: \$#< +,8 >&=\$(, /:%74 8\$ /%*"&M*+\$3\$ \$#,280*>,18 ,"

.280D.*"4 .+38 .:=38,5%\$((E 6\$+&>="U34A%D#"8\$ 2#&%/""\$%6*+<(E6,4 \$8,R*70:+34
\$=2.70\$4 E \$8,R*70:+,2 .2%(\$+<./,"8,2 , #,2 >\$ *78\$("<8"(\$.280*0*(D8, (* +38 \$8+=7\$
5"\$+38 \$81U:.3 +34\$8+=7\$4+, *#7#*0, *%5\$.7\$4

P \$8+=7\$25%E4*56\$+&+\$.34 >\$ #*%"= \$(H&8*/2+,. "03%< #D=(\$ 6\$" *R\$%+E(\$+\$
.+E%"R34+,24 ,035,14 , 5"\$8\$ 0"*26,=18*+" 3 ,(\$=E 6\$" &8*+3 6783.3 +:8 (,8&0:8 .+"4
+%,/"D4\$81U:.34 , /: %74 678028,*(#=#,6E4 .

P \$8+=7\$R3%E4*56\$+&+\$.34 >\$ *0%&M*+"\$." /2+,. "03%E H&.3 (duck foot),
#%, (E>*" \$ +,2 6\$+\$.6*2\$.+E , (D.: +34,#,7\$4 >\$.280D*+"\$.+,8 \$5:5< \$8\$%%<O3.34,*
#*%7#+:..3 6&>*+34+,#,>D+3.34 +,2 \$8+=3+"6,1.256%,+E(\$+,4 3 6\$(#1=3 \$8\$%%<O3.34
+34\$8+=7\$4\$ *78\$"*#7.34 #%, (E>*" \$ +,2 6\$+\$.6*2\$.+E .

" \$8+=7*4>\$ \$8\$.1%,8+\$" \$#< +, *#7#*0, *%5\$.7\$4(* +38 H,E>*" \$ \$82U:+ "6,1
(3/\$8".(,1 #=\$&56,2 (0*8 \$#,+*=*7 \$8+"6*7(*8, +34#%\$,1.\$4).

"I|IQKL ?N?IF`XEIL VI? FIL ?OFYUEL

6"83+E%\$4\$ *8.:(\$+F8*" .1.+3(\$ *=D5/,2 (* %2>(" .+E .+%,OF8 (inverter),
"07,26\$+\$.6*2\$.+E (* +38 \$8+=7\$(* +"4#\$\$%6&+: 028\$+<+3+*4

- +3=*0"\$/*7%".3D.: 3=*6+%,8"6,1*=D5/,2 (gateway)
- ,(\$=E *66783.3 (* D=*5/, %, #E46\$" \$8+7.+,"/, .+\$(&+3(\$
- D=*5/,4 O, %&4#*%".+%,OE46\$" #"H*H\$7:.3 ,%><+3+\$4(\$#,O25E (<8"(34
\$8&.+%,O34=*"+,2%57\$4
- \$8\$.+%,OE =*"+,2%57\$4* #*%7#+:..3 (#=#,6\$%7.(\$+,4 +34 #+*%:+E4 6\$" *#\$8\$O,%&
- #%,. \$%(.5E .+%,OF8 .+38 #*%7#+:..3 2#*%>D%(\$8.34D:4 <+,2 *#\$8D%>*",
6"83+E%\$4+38 O2.",=,5"6E >*(%,6%\$.7\$ 6\$>"+F8+\$4+38 \$#\$7+3.3.* *R:+"*%6&>*("6&
R*#%\$. (D83

P 3=*6+%,8"6E,8&0\$ *=D5/,2 (gateway) >\$ D/*" +\$ *RE4/\$%\$6+3%".+"6&

- I%,O,0,.7\$ 24 V DC
- m1%*4 USB , RS485 , ETHERNET RJ45
- A%:+<6,== \$ *#"6,"8:87\$4 0">8F4 \$8\$58:%".(D8, #%:+<6,==, bus
- I/O DOx4 , Dix4 , Alx1 , AOx1

P 3=*6+%,8"6E,8&0\$ >\$ *R\$.O\$=7M*4,8 #=E%3D=*5/, +34\$8+=7\$4\$6<(\$ 6\$".+38
#*%7#+:3 \$.,/7\$4 +34 61%"\$4cpu, (D.: %*=D="+,2%57\$4m\$ #*%"=(H&8*+\$\,(8&0\$
/*"%).(1 & \$#"6<8".34(HMI unit) (* :

- K#"6<8".3 2U3=E4>*%(.6%\$.7\$4
- K#"6<8".3 0"\$%%,E25%,1 .+,8 .+&+3
- K#"6<8".3 2U3=E4.+&>(34
- K#"6<8".3 .O&=(\$+,4 transducer
- K#"6<8".3 2#*%D8+\$\$.34
- K#"6<8".3 2#<+\$.34/2#D%+\$\$.34
- V28\$+<+3+\$%1>(".34 #\$\$\$(D+%:8(D.: 6\$>,0E53.34

P (,8&0\$ \$#"6<8".34 (#,%*7 8\$ *78\$".280*0*(D83 (* #*%"..<+*%*4+34(7\$4\$8+=7*4
O<.,8 D/" +D+,"\$028\$+<+3+\$

E@GXMCNIEXFK\LMXWF`@E\ aIGYGVU?L

OFIQEUCEOG

KO,%&+38\$8+"6\$+&+\$.3 2O".+&(*8:8 O2.3+E%:8 (* 8D,24 E \$%/"6E*56\$+&+\$.3
8D:8 #,2 D/,28 +\$ =*"+,2%5"6&\$%\$6+3%".+"68#,2 \$8\$OD%,8+\$".+,8 .28,#+"6< #78\$6\$
*R,#=".(1 . S6+<4\$#< +38 #=E%3*56\$+&+\$.3 +:8 8D:8 O2.3+E%:8, #*%"=(H&8*+\$6\$" 3
\$8+"6\$+&+\$.3 +,2 +%,O,0,+"6,1 6\$=:07,2 +,24 (D/%" +,8 #78\$6\$ +%,O,0,.7\$4.
A*%"=(H&8*+\$#7.34 3 \$#,(86%28.3 +,2 \$8+"6\$>".+&(*8,2 O2.3+E%\$, 6\$>\$%".(<46\$" 3
#%,*+,"(\$7\$ +,2 5"\$ (\$6%& \$#,>E6*2.3 (* H&.3 +*4,0357*4 +,2 6\$+\$.6*2\$.+E 6\$" 3
(*+\$O,%& +34.* /F%, \$#,>E6*2.34 *8+<+34 SSG ID=,4 #*%"=(H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$ +38 ,%>E *56\$+&+\$.3 +,2 O2.3+E%\$ 6\$>F4 6\$" ," *%5\$.7*4 \$%/"6E4
%1>(".34, 0,6"(E4 6\$">D.34.* =*"+,2%57\$,2 *R,#=".(1 6\$" *6#\$70*2.34 #%,..#"6,1 .

0EOIQAXFGIJEU?

I, 3/,(8:(D8, .256%<+3(\$ O2.3+E%\$>\$ 0"\$>D+*=",H,""0E O2.3+E%\$6\$">\$ *78\$"
.280*0*(D8, (D.: \$2+,+\$82<(*834 0"&+\$R34 "(8&+:8 (* 3=*6+%,6"83+E%\$ m\$
#*%"=(H&8*"

- ü P/,(8:+"6< >&= \$(, (* 3/,\$570*4 6\$" \$8*("+.E%\$ \$5:5E4 >*%(<+3+\$4
- ü ;"=\$8."D/ O7=+%\$8\$%%<O3.34

ü d&.3 / .="\$8."D 6\$+&>="U34
 ü d\$=H70\$.O&=" \$4 2#*%#7*.34
 ü d\$=H70\$8+*#" .+%,OE4
 ü S=\$.+ "6<\$8+"6%\$0\$.("6<.180*(, .:=E8,4 6\$+&>="U34
 ü S"0"6E+E%"R\$83+E%\$"\$2+<(\$+3 +&82.3 "(&8+:8
 ü B*8<(*+%, *=D5/,2 O7=+%,2\$8\$%%<O3.34
 ü ?\$8<(*+%, *=D5/,2 #7*.34 =" +,2%57\$4

%M@USIMXWF`@?L

O2.3+E%\$4>\$ *78\$">+"6E4*6+,#7.*:4 , #*%".+%,O"6<4=,H,""0E4, (* %<+,%*4
 +%"F8=,HF8 (+%7=,H), I, 6D=2O,4+,2 O2.3+E%\$>\$ *78\$"6\$+\$.6*2\$.(D8, \$#< *"0"6<
 =*#+<6,66, /2+,703%, (* "./2%D4*8"/2+"6D4#+*%25F.*"4 " *R:+"% "6D4#"O&8**"4+:8
 =,HF8 >\$ D/,28 O%M\$%"+6\$ ="\$8>*7(* \$6%7H"\$+. * 8\$ (#,%,18 8\$ =" +,2%5,18 (*
 ("6%D4\$8,/D4. " &R,8*4>\$ *78\$"/\$=1H0"8," 6\$">\$ *O\$%(<M,28(* \$.O&="\$.

" %<+,%*4+% "F8=,HF8 >\$ D/,28 H*="+.+,#,"3(D8, #%,O7=5"\$ (D5".+3 ,56,(*+%"6E
 \$#<0,.3 . I, 6D=2O,4 *.:+"% "6& \$#< +38 #=*2%& +34 6\$+&>="U34>\$ 0"\$>D+***"0"6E
 0"\$(<%O:.3 5"\$+38 *R,(&=28.3 +:8 #\$=(F8 +34#7*.34 F.+ * 8\$ *#"+25/&8*+"\$(*7:.3 +,2
 >,%1H,2 6\$" +:8 6%\$0\$.(F8 *8 5D8*", #,2 (*+\$070,8+\$" .+, .1.+3(\$ 6\$" .+"4 .:=38F.*"4 ,
 \$==& 6\$" (*7:.3 +,2 6"8018,2 *(O&8".34 O"\$8,(D8:8 .28+,8".(,1 6\$+& +38 #\$\$%&==3=3
 =" +,2%57\$8 O2.3+E%:8.

I\$ D0%\$8\$+,2 O2.3+E%\$>\$ *78\$ "H\$%D:4+1#2, 62=7.*:4 (* 0"&%6**"\$M:E4 L10
 +,2=&/" .+,8 100,000 :%F8 =" +,2%57\$4&+: \$#\$< +"402.(*8D.+*%*4 .28>E6*4 =" +,2%57\$4
 m\$0"\$>D+*",0,8+:+,14 +%,/,14 /%,8".(,1 , #,2 +, #,>+,18+\$" 6\$" .2.O755,8+\$" (* 2U3=E
 #7*.3 *= \$7,2 . * &R,8\$ 6:8"6E4 (%OE4 6\$" 0"\$+3%,18+38 \$6%"HE>D.3 +:8 =,HF8. " ,
 ,0,8+:+,7 +%,/,7 >\$ D/,28 *="6,""0E ,0<8+:.3 (* *"0"6E*#"O\$8**"\$6E.6=E%28.3, F.+ * 8\$
 0"\$O\$=7M*+\$0"&%6**"\$M:E4 6\$+& #%,.D55".3 7.3 (* \$2+E8 +:8 *0%&8:8. " ,0,8+:+,7
 +%,/,7 >\$ *78\$" *56=:"H".(D8," . * .+*5\$8< 6D=2O,4 6\$" >\$ ="#\$78,8+\$" (* *= \$O%<
 ,%26+D=\$", #,2 0"\$+3%*7+\$" .+\$>*%E .+&>(3 (D.\$.+, 6D=2O,46\$" *6+"8&..*+\$" (D.:
 07.6,2 =7#\$8.34 #%,. \$(,.(D8,2 .+, .+*%O<(*8, &R,8\$?* +, 70", ,%26+D=\$", >\$
 ="#\$78,8+\$6\$" +\$ D0%\$8\$2+,1 +,2 &6%,2 I\$ D0%\$8\$+,2 &==,2 &6%,2 >\$ ="#\$78,8+\$"
 #7.34 (,%26+D=\$", 6\$+&+,8 70", +%<#, P .+*5\$8,#,73.3 +:8 \$R<8:8 >\$ 578*+"\$(D.:
 *"0"6E40"&+\$R34=\$H2%78>:8 *O,0"\$.(D834 (* 0\$6+2=7,24#%,.+\$.7\$4 \$#\$< +, ="#\$8+"6<
 D=\$",

O2.3+E%\$4>\$ *78\$"\$*%<U26+,4 "6\$8<48\$ U1/*+\$" (* O2."6E 626=,O,%7\$\$D%\$
5"\$>*(,6%\$.7\$*\$%7,2.+38 6\$+&>="U3D/%"150`C.

.YIQA Q?F?XQEM`L

I\$ 2="6&6\$+\$.6*2E4 +,2 O2.3+E%\$>\$ *78\$"+\$ \$6<=,2>\$ E ".,018\$(\$ E 6\$=1+*%\$

'C`C?	.YIQ_	'MNGNGUWXW
A*%7H=3(\$	_2+,.703%,4	DIN 1691 0.6020
g<+,%*4	;O\$"%,*"0E4 _2+,.703%,4	DIN 1696 0.7040
tR,8*4	K8>%\$6,1/,4 _&=2H\$4	DIN 17200 1.1186
Z%\$8&M"\$	;6=3%2(D8,4 _&=2H\$4	DIN 17212 1.6523

)IV?XF`@?L ?O?@@_TWXWLUYF@GK@?

;+38 *".5\$:5E 6&>* O2.3+E%\$ >\$ *78\$ " #%,.\$%(,.(D8,4 62="80%"6,1 +1#,2
/\$=1H0"8,4 ."5\$.+E%\$4#*%",%".(D8:8 0"\$+.&.*:8 (* \$O\$"%1(*8, 6&=2((\$, #,2 *#"+%D#"
#%<.H\$.3 .+, *..+*%"6< +,2 6\$"+3 %1>("3 +:8 /\$%\$6+3%"+"6F\$#<.H*.34 +,2 >,%1H,2
\$8&=,5\$ (* +38 +\$/1+3+\$ #*%"+%,OE4+,2 O2.3+E%\$."5\$.+E%\$4>\$ OD%*O7=+%\$D%,4
6\$+==\$E=,2 (*5D>,24 +,#,>+3(D8, (*+\$R1 +,2 .+,(7,2 +,2 O2.3+E%\$ 6\$ " +:8
3/,\$#,%%,O3+"6F8 .+,"/7:8 +,2 ."5\$.+E%\$, F.+* 8\$ #\$\$D/*"#=E%3#%,.+\$.7\$ \$#\$< .6<83,
\$6\$>\$%.7*46\$"RD8\$F(\$+\$.

)IV?XF`@?L Q?FAJYliWL / ZAXW

O2.3+E%\$4>\$ *0%&M*+\$D.: +,2 .+,(7,2 *R\$5:5E4 .+, ."5\$.+E%\$ 6\$+&>="U34
#,2 \$#,+*=*7 +\$2+</%,8\$+3 H&.3 +,2 .256%,+E(\$+,4. ."5\$.+E%\$4>\$ 0"\$>D+*">&= \$(,
./0"\$.(D8, .+"4 \$%/D4+,2 .28+,8".(,1 5"\$+38 \$#,6,#E >,%1H:8 2U3=F8 .2/8,+E+:8 ,
(* +38 *=&/+.3 \$F=\$" \$7*.34 6\$" >\$ *78\$ " *8 .*"%& .280*0*(D8,4 . ."5\$.+E%\$4
6\$+&>="U340*8 >\$ D/*" 3/,\$#,%%,O3+"6< 2="6< D+." F.+* 8\$ (38 2#&%/*" #*%7#+:3
%1#8.34 +,2 \$D%\$\$#\$< +, 2="6< \$2+< 6\$" 8\$ 0"\$O\$=7M*+\$'+\$>*%E \$#\$<0,.3 +,2
."5\$.+E%\$ 6\$>' <=3 +3 0"&%6*"M:E4+,2 O2.3+E%\$ P >\$ H&.3 *0%&M*+\$+, 0&#*0, +,2
(3/\$8,+.7,2 #&8: . * *\$=+"6,14 \$#,,%%,O3+E%*\$6%\$0\$(F8.

9EFA[GXW QUOWXWL

P (*+&0,3 6783.34 >\$ 578*+\$(D.: .2.+E(\$+,4 +%,/\$="F8 6\$" +%\$#*M,*"OF8
"(&8+:8. " "(&8+*4>\$ *78\$"+1#,2 V, H\$%D:4+1#,2, \$8>*6+"6,7.+3 MD.+36\$" 6\$+&==3=\$
*#"=*5(D8," F.+* 8\$ (*+\$070,28 (* \$.O&="*\$ +38 #%,H=*#<(*83 "/1 . " +%,/\$=7*4>\$
#%,.\$%(<M,8+\$".+,8 &R,8\$(* .1.+3(\$ 6:8"6E4 .1.O"R34. I, .1.+3(\$ (*+&0,34 6783.34
>\$ *78\$" \$2+,+\$82<(*8, , 03=. /"0"\$.(D8, (* "0"6< +%<#, -(* \$8\$6="8<(*8\$ #D=(\$+\$
.+E%"R34,2 6"83+E%\$F.+* 8\$ (*"F8,8+\$" +\$ O,%+7\$+\$ D0%\$8\$O2.3+E%\$6\$" 6"83+E%\$
6\$" 8\$ 0"\$O\$=7M*+*\$2+<(\$+\$ 3 ,%>E +&.3 "(&8+:8, /:%74 +38 \$8&563 #*%",0"6E4
%1>("34.

*YEQF@GQIOWF`@?L

O2.3+E%\$4 >\$ #7%8*" 6783.3 \$#< 3=*+%,6"83+E%\$.15/%,8, , +1#,2
H%\$/2626=: (D8,2 0%,(D\$, +%"O\$. "6< 6\$+&==3=34'./1,4 , (,%OE4 d3, +2#,#,"3(D8, 6\$+&
IEC, #%,+\$.7\$4 +,2=&/'+.+,8 IP 54, 6\$+&==3=, 5"\$=*"+,2%57\$* +&.3 400V / 50 Hz.
6"83+E%\$4\$ *78\$"\$*%<U26+,4

a?YZU[? ?XT?YEU?L

O2.3+E%\$4 >\$ 0"\$>D+*" H\$=H70\$\$.O\$=*7\$4 +, #,>+3(D83 .+38 DR,0, +,2
.256%,+E(\$+,4, 5"\$ #%,+\$.7\$ D8\$8+"2#*%#7*.34 P H\$=H70\$ \$*78\$"%2>(".(D83 F.+* 8\$
\$8,75*" . * #7*.3 *=\$O%&\$8F+*%3\$#< +38 ,8,(\$+."6E #7*.3 =*"+,2%57\$*6\$" >\$ D/" +38
028\$+<+3+\$8\$ #\$\$\$D/*""6\$8E#,.<+3+\$ \$D%\$. * #*%7#+:3 \$8&5634 F.+* 8\$ \$#,O*2/>*7
+2/<8 2#*%O<%+:.3 +,2 O2.3+E%\$E +,2 6"83+E%\$P H\$=H70\$ \$*78\$5\$=H\$8".(D836\$" >\$
0"\$>D+*"0"6<6&=2((\$ #%,+\$.7\$4 5"\$+38 \$#,O25E \$+2/3(&+:8 6\$+&+38=*"+,2%57\$*34
\$==&6\$" 5"\$+38 028\$+<+3+\$180*.34 (* \$*%\$5:5< 5"\$+38 \$#<%%"U3,2 *6+,8:(D8,2
\$D%\$* &==, /F%, .

a?YZU[? ?OFENIXF@GT`L

;+38 DR,0, +,2 O2.3+E%\$>\$ H%7.6*+\$H\$=H70\$8+*#" .+%,OE4 #,2 \$#,+%D#"+38
\$8+7>*+3#*%" .+%,OE +,2 O2.3+E%\$. * #*%7#+:3 .+&.34 2#< O,%+7, S78\$""0"6&
./"0"\$.(D83 , F.+* 8\$ D/" 0"\$+, (E #=E%,24 0"D=*2.34 <., 6\$" 3 0"\$+, (E +34
.: =38,5%\$((E4 , 6\$" >\$ OD%""0"6<07.6, \$#< \$8>*6+"6<.* 2U3=D4>*%(,6%\$.7*4=&.+/, ,
(* *.:+*%0"6E (*+==\$6E*87./2.3 , 5"\$*=&/'+. *4 \$F=*""4 #7*.34 6\$" +38 \$#,O25E >,%1H,2
.* /\$(3=D4 #\$\$,/D4

"Y?XFIQ_L XhO[EXCGLQ?FAJYliWL

I, .256%<+3(\$ O2.3+E%\$ >\$ OD%*".+, .+<(", 6\$+&>="U34*=\$.+ "6< .280*+"6<
.:E8\$, #,2 .280D*+"\$ (* +3 5%\$((E 0"6+1,2, F.+* 8\$ (38 2#<6**8+\$".* 6%\$0\$. (,14 6\$"
O,%+7.*"4+\$ 076+2\$+:8 .280*0*(D8:8 .:=38F.*:8 .

j@V?O? N?@?QGYGhJWXWNLUEXWL

I, .256%<+3(\$ >\$ OD%*".+38 #%<.,U3 +,2 6*=10,24:

- ?\$8<(*+%, 5=26*%7834%,5"\$6,1 +1#,2 (* 6=7(\$6\$0! 1 bar 5"\$ D=*5/, #7*.34
6\$+&>="U34
- B*8<(*+%, #%%\$6,=,1>3.34 +34 2#,7*.34 .+, O7=+%,\$8\$%%<O3.34#%,*"0,#,"*7
5"\$+38 \$8&563\$8+"6\$+&.+\$.34+,2 O7=+%2

\$Y`@EIL\$E@IXF@ET CEOBKTm@ElE^?CEOROEYIQ`L %?]UkWXWL

OFIQEUCEOG

KO,%&+38 #=E%3\$8+"6\$+&.+\$.3 2O".+&(*8:8 5*O2%F8(\$6+"8"6F\$ (* 8D*4E +38
\$%/"6E*56\$+&.+\$.3 8D:8 #,2 D/,28 +\$ 70"\$=\$"+,2%5"6&\$%\$6+3%".+"6&* +"42O".+&(*8*4
6\$" *80**6+"6& \$8\$OD%,8+\$".+,8 .28,#+"6< #78\$6\$ *R,#=".(,1 . A*%="\$ (H&8*+"\$ 3
\$8+"6\$+&.+\$.3 +,2 3=*6+%,5"6,1 #78\$6\$+:8 2O".+&(*8:8 5*O2%F8 6\$>F4 6\$" +:8
6\$=:0"F.*:8 \$<+,8 +,#"6< #78\$6\$0"\$8,(E4 "/1,4 6\$" *=D5/,2 (D/%"+, .+\$>*%<.3(*7,
3=*6+%,5"6E4 .180*.34 +34 5DO2%\$4 A*%="\$ (H&8*+"\$ *#7.34 3 \$#,RE=:3 6\$" \$
\$,28\$% (=53.3 +:8 2O".+&(*8:8 5*O2%F8 , 6\$>\$%".(<4 6\$" 3 #%,*+,"(\$7\$ +,24 5"\$
(\$6%&\$#,>E6*2.3 (* H&.3 +"4,0357*4 +,2 6\$+\$.6*2\$.+E 6\$" 3 (*+\$O,%& +34.* /F%,
\$#,>E6*2.34 *8+<4+34 SSG ID=,4 #*%="\$ (H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$ +38,%>E
*56\$+&.+\$.3 +:8 5*O2%F8 6\$>F4 6\$" , " %5\$5.7*4\$%/"6E4%1>("34, 0,6"(E4 6\$" >D.34 . *
="+,2%57\$,2 *R,#=".(,1 6\$" *6#\$70*2.34 #%,.:#6,1 .

0EOIQAXFGIJEU?

" 0"\$+&.*"4 6\$" 3 0"\$(<%O:.3 +:8 5*O2%F8>\$ *78\$"+D+,"*4#,2 8\$ *#"+%D#,28
+38 /:%74 (*+\$+%,#D4&(*.3 *56\$+&.+\$.3 .+3 >D.3 +:8 \$8+"6\$>".+&(*8:8 . B\$+&+\$ =,"#&
"/1,28 +\$ \$8\$O*%<(*8\$.+, I*1/4 Z*8"6F8A%,0"\$5%\$OF8

"^AGNYIXC_L [E^?CEORO[EMFE@GZA]CI?LQ?]UkWXWL

" 0*R\$(*8D46\$>7M3.34\$ D/,28 \$6+"8"6E#*%".+%*O<(*835DO2%\$* #=\$7.", \$#<
\$8,R*70:+, /&=2H\$ P .2==,5E +34 "=1,4 \$#< +,8 #2>(D8\$ 626="6F80*R\$(*8F8 6\$>7M3.34
#%,4 +,8 6F8, "=1,4 >\$ 578*+\$#\$#< .\$.%:+E , , ,#,7,4 >\$ OD%*+\$#\$#< #*%".+%*O<(*83
5DO2%\$D.: \$%>:%:+F8 .280D.(:8 6\$" >\$ 62=& .+,8 #2>(D8\$ +34 0*R\$(*8E4 #&8: . *
+%,/,14 \$#< teflon E &==, 6\$+&==3=, 2="6< F.+* 8\$ #\$\$%\$6,=,2>*7 +"4("6%D4\$8:(\$=7*4
+,2 #2>(D8\$ +34 0*R\$(*8E4 " =*#70*4 .&%.34 >\$ #D#* 8\$ D/,28 *\$%6E
\$==3=,*#6&=2U36\$ 8\$ 0"\$(\$,%OF8,28 =,5\$%>("6ED="6\$

" =*#70*4 +,2 .\$.%:+E #2>(D8\$, *=&/.+,2 1U,24 300mm, >\$ *78\$"
6\$+\$.6*2\$.(D8*4 \$#< \$8,R*70:+, /&=2H\$ AISI 304 6\$" >\$ #D#*8\$ 0"\$>D+,28=: %70\$ \$#<
*=\$.+ "6<, 1U,24 +,2=&/.+,8 100mm, *16,=\$ %2>("M<(*836\$ " \$8+"6\$+\$.+&."(3. " =*#70*4
+,2 RD.+%,2D=6,8+\$#\$#< .:=38:+D4 6\$+&==3=\$0"\$(\$,%O:(D8*4 %&H0,24\$#< \$8,R*70:+,
/&=2H\$ AISI 304 6\$" \$8\$%+F8+\$(* \$=2.70\$ \$#< .+\$>*%& .3(*7\$ +34 5DO2%\$4D.:
\$8,R*70:+:8 *8+\$+E%:8F.+* 8\$ *78\$ "028\$+E3 %1>(" .3 +,2 RD.+%,24 #%,4 +,8 #2>(D8\$
+340*R\$(*8E4

P 5DO2%\$#D#*8\$ D/*" 0"&0%,(\$ \$#< *./\$.%:+< 0&#*0, \$#< \$8,R*70:+, /&=2H\$,
=&/.+,2 #=&+,24 0,80 m (6"56="0F(\$+\$6\$ " #\$\$%\$#D+,1U,24 #*%7+\$ 100 mm , *#7.34
\$#< \$8,R*70:+, /&=2H\$ P 5DO2%\$+3%7M*+\$#38 6*8+% "6E,=F8\$ (D.: *0%&8,26\$ ".+38
+DU3 +340*R\$(*8E4.+ , O,%*7,6783.34

;1(O:8\$ (* Sb 12255-3, 3 O<%+" .3+,2 .\$.%:+E >\$ #D#*8\$ =(H&8*+\$ "7.3 (*
250N/m. I, 6"83+<O,%+7, +34 \$#="80%,("6E45DO2%\$4\$ =(H&8*+\$ "1,5 kN/m2 6\$" +,
(D5".+, HD=,4 6&(U34, #*%="(\$H\$8,(D8:8 <=:8 +:8 O,%+7:8 (* *R\$7%*.3+,2 6"83+,1
O,%+7,2 0*8 #D#*8\$ R*#*%8&, 1/500 +,2 (E6,24 +345DO2%\$4

I, O,%*7,6783.34 0"\$>D+*"6"83+E%"6\$" (3 6"83+E%"+,%,/<. 6"83+E%"\$478\$"
+1#,2 H%\$/2626=(D8,2 0%,(D\$./*0"\$.(D8,4 5"\$.28*/E =*"+,2%57\$S1), .1(O:8\$ (* +38
Sb 60034-1, (* H\$>(< #%,.+\$.7\$4]g55. " +%,/,7 >\$ *78\$ ".2(#\$5*74 H\$%D:4+1#,2 \$#<
*=\$.+ "6< 2="6< 0"\$ (D+%,2 AE p 500mm 6\$" #=&+,24 p 100 mm, >\$ (#,%,18 8\$ OD%,28
O,%+7,p 1500kg 6\$" >\$ 6"8,18+\$"#*%"O*%*" \$6&&8: .+, /7=,4 +,2 *R:+"*% "6,1 +, /F(\$+,4
+340*R\$(*8E4#2 >\$ *78\$="*7, 6\$" \$#,1+:4 ,%"M<8+.",

I, 6\$=F0", +%,O,0,7\$4 >\$ *78\$ "H\$%D:42#,H%1/",2 +1#,2 6\$" >\$,0*1" (D.\$
+38 6*8+% "6E,=F8\$ +340*R\$(*8E46\$>7M3.34

P 6\$+\$8,(E +,2 %*1(\$+,4 #*%"O*%*" \$6&\$ 578*+\$(* 0\$6+1=" ,=" .>3+"6E4*#\$OE4

P +\$/1+3+\$.&%.34 >\$ \$8D%/+\$*\$. * o2m/min. ?#%,.+& \$#< +,24 6"83+E%",24
+%,/,14 +345DO2%\$4\$ #D#*8\$ +, #,>*+3>,18 ,%" ,0"\$6<+*#45"\$+, .+\$(&+3(& +34.+38

#*%7#+:3 \$87/8*2.34 *(#07:8 . O , .28+*=*.+E4 /%E.34 (service factor) +,2
3=*6+%,(*"+E%\$ +34 5DO2%\$4\$ =\$(H&8*+" 7.,4 (* 1,50 6\$" +, .1.+3(\$ (*+\$0<.34
6783.34 >\$ *78\$" +1#,2 *=6,*"0F8 5%\$8\$M"F6\$" 2#,,5".(D8, 5"\$.28*/E =*"+,2%57\$
20.000 :%F8.

P D0%\$.3 +34 5DO2%\$4.+38 6*8+%"6E6,=F8\$ 578*+" (D.: 0\$6=2=",*"0,14
D8.O\$"%2+% "HD\$&+&==3=,28\$ 0*/+*7 +\$ \$R,8"6&6\$" \$6+"8"6&D,%+7\$#,2 \$8\$#+1..,8+\$"
6\$+&+38=*" "+,2%57\$,2 .\$.%:+E . m\$ #D#*8\$ #%,H=*O>,18 6\$+&==3=*4"\$+&R*",4F.+* .
#*%7#+:3 ("6%,\$8:(\$="F8 .+38 .+DU3 +34 0*R\$(*8E4 8\$ (38 (*+\$070*+" 3 5:87\$ +34
6783.34 .+, 6*8+%"6<D0%\$8, O , *8.O\$"%4 +% "HD\$4\$ *78\$"2#,,5".(D8,4 5"\$.28*/E
=*"+,2%57\$0.000 :%F8.

IS 6\$=F0"\$ 3=*6+%"6E4#\$/E4 #D#*8\$ *78\$" H\$%D:4 2#,H%2/7,2 +1#,2, >\$
0"D%/8+\$"(D.\$. * \$5:5,14 6&+: \$#< +, 0&#*0, +34 0*R\$(*8E4 6\$" >\$ 6\$+=\$E5,28 .
0\$6+1=", ,=".>3+"6E4 #OE4 6&+: \$#< +38 #*%".+%*O<(*83 5DO2%\$6\$" \$#< *6*7 .+8
3=*6+%"6<#78\$6\$+34 (,8&0\$4 . ,=".>3+"6<4 0\$6+1=",4 >\$ 0"\$>D+*"+,2=&/" .+8 0D6\$
*#\$OD4

;1.+3(\$.28*/14 \$#\$5:5E4 *"#=#<8+:8

P #*%".+%*O<(*83\$6+"8"6E5DO2%\$340*R\$(*8E4 6\$>7M3.34OD%\$83%+3(D8,6\$+&
+, (E6,4 +34+, .1.+3(\$.28*/14 \$#\$5:5E4 *"#=#<8+:8, +, ,#,7, >\$ \$#,+*=*7+\$#\$<:

Ø 1 6*8+%"6<6\$8&=" .2==,5E4 *"#=#<8+:8 (* =*6&83 \$#,+%&55".34 (<#,2
+,#,>*+*7+\$" 3 \$8+=7\$*"#=#<8+:8) (* %2>("M<(*83.+&>(3 2#*%/*7=" .34 (D.:
+3=*6,6,1 /"%".+3%7,2

Ø 2 #=*2%"6&6\$8&=" .2==,5E4 *"#=#<8+:8 (* %2>("M<(*83.+&>(3 2#*%/*7=" .34
(D.: +3=*6,6,1 /"%".+3%7,2

Ø ;+3%75(\$+#+:8 6\$8\$="F8.2==,5E4 *"#=#<8+:8

Ø K8+=7\$*"#=#<8+:8 +1#,2 vortex , *=&/" .+34 #\$/E4 15m3/hr #,2 >\$,035*7 +\$
*"#=#D,8+\$#\$' *2>*7\$4.+38 0*R\$(*8E .+\$>*%,#,73.34 "=1,4

Ø ;1.+3(\$ \$8D=62.34+34\$8+=7\$4* #*%7#+:3 .28+E%3.34

I, .1.+3(\$.28*/14 \$#\$5:5E4 *"#=#<8+:8 >\$ *78\$" 6\$+\$.6*2\$. (D8, \$#<
\$8,R*70:+, /&=2H\$ AISI 304.

B\$+&+, .+&0", +,2 0"\$5:8".(,1 >\$ 2#,H=3>,18:

Ø A".+,#,"3+"6< ISO9001-2015 E ".,018\$,(

Ø A78\$6\$4+,2=&/" .+8 2 *56\$+*.+3(D8:8 .2.+3(&+:8 6\$+& +38 +*=*2+\$7\$+%"*+7\$
*56\$+\$.+&. "4 *#R*%5\$.7\$4-2(&+:8 .

)hXFWC? Q?]?@IXCGhNE@ICEF@IQG?O?YIGhMNE@JEUYIXWL

;+3 5DO2%\$78\$"+,#,>+3(D8, .1.+3(\$ 6\$>\$%".(,1 +,2 2#*%/"= ".+E 6\$"+,2
6\$8\$="1 2#*%/*7=".34\$#,+*=,1(*8, \$#< (7\$ 6\$+\$6<%2O,2&R,8\$ #*%".+%*O<(*83UE6+>%\$
5"\$+ ,8 #2>(D8\$, +\$ +, "/F(\$+\$ +,2 6\$8\$="1 2#*%/*7=".346\$"+,8 +% "5:8"6<2#*%/"= ".+E
m\$ *78\$"028\$+E3 %1>(".3 +34>D.34 +:8 U36+>%F8+<., 6\$+&#=&+,4<., 6\$"6\$>' 1U,4.
6\$>\$%".(<4>\$.2(#=3%F8*+" (* .1.+3(\$ *6+<R*2.348*%,1 2#< #7*.3.

*YEQF@IQ_INUO?Q?ENUFWLNE@IXF@ET_CEOWKTM@?L

;+38 5DO2%\$ \$ +,#,>+3>*7 , #78\$6\$4*=D5/,2 +,2 .%\$:+E 6\$+\$6*2\$.(D8,4 \$#<
\$8,R*70:+, /&=2H\$ (* H\$>(< #%,.+\$.7\$4]g55. ;+,8 3=*6+%"6<#78\$6\$+,2 .%\$:+E >\$
#%D#*8\$ #*%"= \$(H&8,8+\$"

Ø B1%",40"\$6<#+34

Ø S#=",5"6<40"\$6<#+34_ *%",6783+34K2+<(\$+34=*"+,2%57\$4

Ø _%,8,0"\$6<#+*4

Ø P=*6+%,8<," (%*=D

Ø %",0"\$6<#+*4

Ø A%,.+\$.7\$ 2#*%O<%+" .34

Ø V1, *#\$OD4 *=*1>*%*4 028\$("6,1 5"\$ +38 +3=(*+&0,.3 .3(&+:8 =*"+,2%57\$4
H=&H34

Ø K8+7.+\$.3 .2(#268:(&+:8 =*"+,2%5,1.\$ (* >%(,+.&+3

Ø G,"#<4*R,#=".(<4 #%,.+\$.7\$4 (\$O&=***4, \$2+<(\$+," 0"\$6<#+*46+=).

TM\AFSXW_IYhGL

OFIQEUCEOG

KO,%& +38 #=E%3 *56\$+&.+\$.3 .+, 6+7%", \$O20&+:.34 =*"+,2%5"6&*8"\$7,2
.2.+E(\$+,4 \$O20&+:.34 "=1,4 #,2 #*%"= \$(H&8*(\$ P=*6+%"6<#78\$6\$"/1,4 6\$" *=D5/,2
<=,2 +,2 .256%,+E(\$+,4 03=\$OE +34 O25,6D8+%,2 +34 #\$\$\$6*2E4 6\$" 0,..(D+%3.34
,=23=*6+%, =1+3 <=:8 +:8 \$8+= "F8((D.: %2>(" .+F8 .+%,OF8), +:8 3=*6+%,H\$=H70:8
#=1.34, +,2 6,/=7\$ \$O20\$+: (D834 "=1,4 6\$" 5*8"6&<=,2 +,2 H\$. "6,1 6\$" #*%"O*%"\$6,1
*R,#=".(,1 , (H) O25<6*8+%, \$O20&+:.34 , (5) 6,/=7\$ +*="6E4"&>*.34 \$O20\$+: (D834 "=1,4,
(0) .256%<+3(\$ #\$\$\$6*2E4 6\$" 0,..(D+%3.34 # ,=23=*6+%, =1+3 #*%"= \$(H\$8,(D8:8 01,
\$8+= "F8 0,..(D+%3.34 (= *"+,2%57\$1+1). A*%"= \$(H&8,8+\$ "<=*4 , " 3=*6+%, =,5"6D46\$" 20%\$2="6D.480D.*"4 #*%"= \$(H\$8,(D8:8 +:8 \$5:5F8 8*%,1 #=1.34 (* + "43=*6+%,H\$=H70*4

.180*.34 6\$" +:8 \$5:5F8 \$#,%%,E4 .+>%\$55".(&+:8 6\$>F4 6\$" ," \$#\$%\$7+3+*4 +%,#,"E.">4 .+"4 ,0*1.">4 +:8 \$8+7.+,"/:8 2O".+&(*8:8 0"6+1:8.

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;+3 8D\$ (,8&0\$ \$O20&+:.34 (* O25,6*8+% "6<0"\$/:%".+E%\$ (decanter), >\$ *56\$+\$.+>*7 6\$" , =,"#<4 \$#\$%\$7+3+,4 #*%"O*%"\$6<4*R,#=".(<4 , <#:4 \$8+=7*4 #,=23=*6+%,=1+3 (,8&0\$ #%,#%\$\$.6*2E4#,=23=*6+%,=1+3 (*+\$O,% "6,76,/=7*4 =&.#34.

I, .1.+3(\$ \$2+,\$+").(,1 +34 (,8&0\$4 \$O20&+:.34 >\$ *=D5/*" 6\$" +,24 %2>("+.D4 .+%,OF8 (inverters) +:8 \$8+= "F8#\$/2(D834 "=1,4.

I, .1.+3(\$ \$O20&+:.34 >\$./0"\$+. *7 F.+* 8\$ =*"+,2%5*5 3(D%*4\$8&*H0,(&0\$ 6\$"7 F%*4\$8&3(D%\$

P (,8&0\$ \$O20&+:.34 "=1,4 >\$ #*%"= \$(H&8*" +\$ \$6<=,2>\$ +(E(\$+\$, *8%\$(,8).(D834, (*+\$R1 +,24, 028\$("6<+3+\$4 6\$" (* 028\$+<+3+\$ #%,.\$%(.5E4 +:8 %2>(7.*:8 +,24 \$8&=,5\$ (* +\$ /%\$6+3%".+"6&+34 "=1,4, F.+* 8\$ "6\$8,#,"18+\$" ," #%,0"\$5%\$O<(*8*4\$,0<.">4 6\$+&+3=*"+,2%57\$,24:

1. N25,6*8+% "6<40"\$/:%".+E%\$4
2. K8+=7*4(1+1), >*+"6,1 *6+,#7.(\$+,4 , "=1,4
3. K8+=7*4(1+1), >*+"6,1 *6+,#7.(\$+,4 , #%\$,/E4 0"\$=1(\$+,4 #,=23=*6+%,=1+3
4. ?,8&0\$ #%\$\$.6*2E40"\$=1(\$+,4 #,=23=*6+%,=1+3
5. K8\$(*76+34 "=1,4 - #,=23=*6+%,=1+3
6. B,/=7*4 (*+\$O,%&4 "=1,4
7. Z*8"6<43=*6+% "6<#78\$6\$4

\MVGQEOF@IQ_!L?JS@IXF`@?L

P \$O20&+:.3 >\$ 578*+\$" (* O25,6*8+% "6<0"\$/:%".+E%\$ P *#*=,5E +34 028\$("6<+3+&4+,2 >\$ H\$.".+*7 .+\$ \$6<=,2>\$ 0*0,(D8\$:

- <56,4 +34 "=1,4 #%,4 *#*R*%5\$.7\$3,5 m³/h
- #,,.+< .256D8+%.:34 .+*%*F8 *".<0,2 4 %
- #,,.+< #+3+"6F8\$":%,1(*8:8 .+*%*F8 60-70%

I, .1.+3(\$ \$O20&+:.34 >\$ *#*R*%5&M*+\$",8 <56, +34 "=1,4 (* +\$ #%\$#\$#&8: /%\$6+3%".+"6&\$">\$ *#"+25/&8**"#,,.+< \$O20&+:.34 </" ("6%<+*%,+2 20%.

Z"\$ +38 *#7+*2R3+:8 #\$\$%\$#&8: 0*0,(D8:8 , 0*8 >\$ 578,28 0*6+,7 O25,6*8+%"6,7
0"\$:/:~".+E%\$4 (* *.:+*%"6E 0"&(*+%, +2(#&8,2 ("6%<+*%3\$#< 350 mm 6\$" *.:+*%"6<
(E6,4 +2(#&8,2 ("6%<+*%,\$#< 800 mm.

O25,6*8+%"6<40"\$:/:~".+E%\$4>\$ \$#,+*=*7+\$ "\$#< D8\$ #*%" .+%*O<(*8, +1(#\$8,
62="80%~;6:8"6,1 ./E(\$+,4 6\$" D8\$8\$+D%~,8\$ 6,/=7\$, #,2 >\$ #*%" .+%DO*+\$"8+<4 +,2
+2(#&8,2 (* +38 70"\$O,%& \$==&(* *=\$O%F4="5<+*%*4+%,OD4 P +%,O,0,.7\$ >\$ 578*+\$
\$#< +, 6:8"6< +(E(\$ +,2 +2(#&8,2, 0"\$ (D.,2 **0"6,1 .:=E8\$ #,2 ,035*7 +38 "=1.+ , (D.,
#*%7#,2 +,2 +2(#&8,2. ?* +38 #*%" .+%OE +,2 +2(#&8,2, 3 "=14 H%7.6*+\$"2#< +38
*#70%\$.3 +34 O25<6*8+%"34 018\$(34, (* \$#,+D=*.\$ +\$.2.++\$+"6& (D%3 +34 8\$
0"\$:/:~7M,8+\$"=<5: +,2 0"\$O,%*+"6,1**0"6,1 H&%2,4

I\$.+*%*& .2.++\$+"6& *R:>,18+\$" #%,4 +38 #*%"OD%*"\$,2 +2(#&8,2 , *8F +\$ 25%&
./3(\$+7M,28 ,(<6*8+%,24 0\$6+2=7,24 \$+D%(:8 6,/=7\$4 .2(#\$%\$.1%" +38 \$O20\$+: (D83
"=1 #%,4 +, 6:8"6< +(E(\$ +,2 +2(#&8,2 , <#,2 *78\$," ,#D4 *R<0,2 , *8F +\$.+%\$5570"\$
*RD%/,8+\$#\$#< +, #7.: (D%,4+,2 +2(#&8,2 , (D.: %2>("M<(*8:8 0"\$O%\$5(&+:8.

O25,6*8+%"6<40"\$:/:~".+E%\$4>\$ *0%&M*+\$".* .+"H\$%<#=\$7." , , +, ,#7, >\$
(#,%*7 8\$ #\$\$\$=&H*~=\$ +\$ 028\$("6& 6\$" .+\$+"6& O,%+7\$:/:~74 #\$\$\$(\$,%OF.*"4 E D8+,8*4
+\$=\$8+F.*"4.

I, +1(#\$8, >\$ #%D#**8\$ D/*" +(3(\$+"6E 0,(E 6\$+\$.6*2E4, F.+* . * #*%7#+:~3
O>,%&4 8\$ *78\$" 028\$+E 3 *#"0"<%>:~3 E \$8+"6\$+&+\$.3 6&>* +(E(\$+,4 /:~".+& .
.:=E8\$4 +%,O,0,.7\$4 +,2 O25,6*8+%"6,1 0"\$:/:~".+E%\$ >\$ #%D#** 8\$ (#,%*7 8\$
\$#,28\$%(,=,5*7+\$" 6\$" 8\$ *RD%/*+\$#\$#< +, .256%<+3(\$ /:~74 +38 \$8&563\$8,75(\$+,4 6\$"
\$#,28\$%(,=<53.34 +,2 .2.+E(\$+,4 +2(#&8,2 -6,/=7\$. I, .1.+3(\$ +2(#&8,2 - 6,/=7\$ >\$
#%D#**8\$ (#,%*7 8\$ \$#,.#&+\$" \$#\$< +, 2#<=,"#, .1.+3(\$, 6"8,1(*8, 6\$+& (E6,4 +,2
O25,6*8+%"6,1 0"\$:/:~".+E%\$ #%,4 +3 (7\$ \$#\$< +"401, &6%*4+,2. 6,/=7\$4 >\$ #%D#**8\$
(#,%*7 8\$ \$#,.#&+\$" \$#\$< +, 2#<=,"#, .1.+3(\$ /:~74 +38 \$8&563\$#,28\$%(,=<53.34 +,2
+2(#&8,2 .

.:=E8\$4 +%,O,0,.7\$4 +,2 O25,6*8+%"6,1 0"\$:/:~".+E%\$ >\$ #%D#**8\$ (#,%*7 8\$
\$#,28\$%(,=,5*7+\$" 6\$" 8\$ *RD%/*+\$#\$#< +, .256%<+3(\$ /:~74 +38 \$8&563\$8,75(\$+,4 6\$"
\$#,28\$%(,=<53.34 +,2 .2.+E(\$+,4 +2(#&8,2 -6,/=7\$.

n=\$ +\$ (D%3 +,2 .256%,+E(\$+,4 , #,2 D%/,8+\$" . * #*\$OE (* +38 "=1, >\$ *78\$"
6\$+\$.6*2\$.(D8\$ \$#\$< \$8,R*70:+, /&=2H\$ I\$ #+*%15"\$+,2 6,/=7\$ >\$ D/,28 *#"#%<.>*+3
#%,.+\$.7\$, (* *#"6&=2U3 6\$%H70",2 H,=O%\$(7,2 I, .+<(" , *6%,E4 +,2 .:=E8\$
+%,O,0,.7\$4 6\$" +\$.+<("\$ *R<0,2 .+*%*F8 >\$ D/,28 *#"6&=2U3 .6=3%,(D+\$==,2 E
#\$\$\$<(",2 2="6,1 6\$" >\$ *78\$" \$8+"6\$>".+F(*8\$. .6*=*+<4 .+E%"R34>\$ *78\$"

6\$+\$.6*2\$.(D8,4 \$#\$< /&=2H\$ H\$((D8,4 6\$+&==3=\$5"\$ \$8+"0"\$H%:+"6\$%,.+\$\$.7\$ 6\$" >\$
OD%*"0"6&\$8+"0,83+"6&#D=(\$+\$ P 6783.3 +,2 +2(#&8,2 >\$ *#"+25/&8*+"\$ (D.: +,2
62%7:43=*6+%,6"83+E%\$

O25,6*8+%"6<40"\$/:%".+E%\$4 >\$ *78\$" *R,#=".(D8,4 (* 3=*6+%"6<(*":+E%\$
.+%,OF8, , , #,7,4 *#"+%D#*+38 6783.3 +,2 6,/=7\$ 6\$" .28+,87M*"2+<(\$+\$ + "40"\$O,% "6D4
.+%,OD4+,2 6,/=7\$. * /D.3 (* +, +1(#\$8, , (* 028\$+<+3+\$(*+\$H,=E4 \$#\$< 1-50 RPM,
#%,5%\$(((\$+7M*+\$3=*6+%,8"6& 6\$" >\$ \$#,+*=*7+"\$ \$#\$< D8\$8 \$8*R&+%+3+, \$.15/%,8,
+"O\$. "6<6"83+E%\$#,2 * =D5/*+"\$ \$#\$< (*+\$+%,#D\$.2/8<+3+\$4.

I\$ H\$. "6&2="6&6\$+\$.6*2E4 >\$ *78\$"+\$ \$6<=,2>\$, E \$8F+*%\$

I1(#\$8, AISI 414

B,/=7\$4 AISI 316

∴=E8\$ +%,O,0,.7\$4 AISI 316

0\$6+1=" ,4*6/*7=" .34 AISI 316

/F%,4 *66D8:∴.34 25%F8 AISI 316

/F%,4 *66D8:∴.34 .+*%*F8 AISI 316

*R:+"%"6<6&=2((\$ \$8>%\$6,1/,4 /&=2H\$4

.6*=*+<4 .+E%"R34 \$8>%\$6,1/,4 /&=2H\$4

I\$ *"0"6&6\$+\$.6*2\$+."6& /\$%\$6+3%".+"6&\$ *78\$"+\$ \$6<=,2>\$, E \$8F+*%\$

- *8\$==&R"(36*O\$=E*66D8:∴.34 25%F86\$" .+*%*F8
- 62="80%"6<4, %(<4 .256%&+3.34+,2 +2(#&8,2 \$#\$< \$8>%\$6,1/, /&=2H\$
- ∴=38,*"0E4 6=*".+E 6\$+\$.6*2E, (* #&/,4 </" 6\$+F+*%, +:8 8 mm
- #%,.+\$\$.7\$ \$#\$< +3 O>,%& (* 6\$%H70"H,=O%&(" .+\$ \$6%,#+*%15"\$+,2 6,/=7\$ 6\$" + "4,#D4 0"<0,2 +34=&. #34
- 0\$6+1=" , "66D8:∴.34 +:8 .+*%*F8 \$#\$< AISI 440 .6=3%2.(D8, (60 HRC)
- 3=*6+%,8"6E2.6*2E \$.O\$=*7\$45"\$#%,.+\$\$.7\$ \$#\$< 2#*%O<%+:.3 .+*%*F8
- .1.+3(\$ \$8&+%+3.34\$8+"6%\$0\$.("6E4#%,.+\$\$.7\$4
- .1.+3(\$ #\$\$\$6,=,1>3.34 6%\$0\$.(F8
- .2.6*2E 5"\$+38\$2+<(\$+3 =7#\$8.3+:8 61%":8 *0%&8:8
- #%,.+\$+*2+"6&6\$=1((\$+\$ \$#\$< \$8,R*70:+, /&=2H\$ (* 6,"=<+3+\$3/,(<8:∴.34

OFYUEIJEFIQ`L EQF_NIXW(LNGYMWYEQF@GYQPMYhGL)

" \$8+=7*4+%,O,0,.7\$4 +34 "=1,4 +,2 O25,6*8+%"6,1 0"\$/:%".+E%\$ 6\$" +,2
0"\$=1(\$+,4 #,=23=*6+%,=1+3 >\$ *78\$" *= "6,*"0,14 %<+,%\$ >+"6,1 *6+,#7.(\$+,4 ,

%2>("M<(*834 #\$\$,/E4 (D.: inverter (* 6,(< \$ #< /2+,.703%, 6\$" .+%,O*7, \$ #<
\$8,R*70:+, /&=2H\$ (* H&.3 .+E%"R346\$" 3=*6+%,6"83+E%\$

" \$8+=7*4 #,=23=*6+%,=1+3 >\$ D/,28 6,(< \$ #< /2+,.703%, , %<+,%\$ \$ #,
\$8,R*70:+, /&=2H\$ AISI 304, .+&+,%\$ \$ #, 8*,#%D8", H&.3 .+E%"R346\$" 3=*6+%,6"83+E%\$
80"6+"6E4./1,4 1,5 kW #%,.+\$.7\$]g55, #\$\$,/E 600 u 3500 l/h.

" \$8+=7*4'=1,4 >\$ D/,28 6,(< \$ #< /2+,.703%, , %<+,%\$ \$ #, \$8,R*70:+, /&=2H\$
AISI420B (1.4028), .+&+,%\$ \$ #, NBR, H&.3 .+E%"R346\$" 3=*6+%,6"83+E%\$80*"6+"6E4
"/.1,4 2,2 kW #%,.+\$.7\$]g55, #\$\$,/E 2 u 10 m3/h.

9GOA[? N?@?XQEM`ŭI?YhC?FGL NGYMWYEQF@GYhFW

P (,8&0\$ #\$\$\$.6*2E40"\$=1(\$+,4 #,=23=*6+%,=1+3\$ #,+*=*7+\$ "\$ #< (" \$ 62="80%"6E
0*R\$(*8E #,2 >\$ 2#,0"\$ "%*7+\$." +%7\$+(E(\$+\$ 6\$" \$ #< (" \$ /,&83 \$ #,>E6*2.34 6\$"
+%,O,0,.7\$4 #,=23=*6+%,=1+3 6\$+\$\$.6*2\$.(D8\$ \$ #< /&=2H\$inox.

d\$. "6& /\$%\$6+3%" .+"6&

- V*R\$(*8E, *=&/".+34 .28,="6E4 /:%3+"6<+3+\$40,7 m3;
- __,&83 +,#,>+*+3(D83 #*%7#,21,2 m \$ #< +, 0&#*0, , 5"\$8\$ 578*+\$3 +%,O,0,.7\$ +34
(* #,=23=*6+%,=1+3/:%74 +3 H,E>*" \$ \$82U:+"6F8 (3/\$83(&+:8
- ;1.+3(\$ #%,0"&=2.348*%,1 – .6<834
- 3 \$8\$0*2+E%*4

O?CEUQFWŬYhGL-NGYMWYEQF@GYhFW

m\$ #%,H=*O>*7+\$+"6<4\$8\$(*76+34

%GJYU?DEF?TG@ALLYhGL

m\$ *78\$".#*"%,*"0E4 \$ #< /&=2H\$inox, 0"\$(D+%,200 mm, (E6,24 5m (* 6=7.3 30°
5"\$1U,4 \$ #<%%"U34,2=&/".+.8 2.3 m.

*YEQF@IQ_INUO?Q?LXJhGL Q?I EYKVJGM

5*8"6<43=*6+%"6<#78\$6\$4>\$ 078*" +3 028\$+<+3+\$/"%".(,1 6\$" *=D5/,2 +,2
6*8+%"6,16"83+E%\$,2 O25,6*8+%"6,1 0"\$/:%".+E%\$ +:8 \$8+= "F8 #,=23=*6+%,=1+3 6\$"
+%,O,0,.7\$4 "=1,4, +,2 6,/=7\$ RD.+%,2 *66D8:.34 6\$" (*+\$O,%&4 "=1,4. m\$ D/" U3O"\$6&
<%5\$8\$D80*"R34-34 +\$/1+3+\$4 #*"% .+%,OE4+,2 +2(#&8,2 6\$" +34 0"\$O,% "6E4+\$/1+3+\$4
+2(#&8,2 - 6,/=7\$.

I, .256%<+3(\$ >\$ #%D#*8\$ +7>+*\$2+<(\$+\$ *6+<4=*"+,2%57\$# #*%"# +F.*"4

- 2#*%O<%+:.34+,2 6,/=7\$
- 2#*%>D%(\$8.346"83+E%:8
- \$028\$(7\$ =*"+,2%57\$4<=,2 +,2 2#<=,"#,2 2#,.+3%"6+"6,1 (3/\$".(,1 (\$8+=7*4
"=1,4, \$8+=7*4#,,=23=*6+%,=1+36.=#.)

Z"\$ 6&>* *70,24 *80*/<(*834 \$+./7\$4 , >\$ #D#*8\$ 2#&%/**"0"6E D80*"R3+,8
3=*6+%"6#78\$6\$6\$>F4 *#7.34 6\$"6,"8< 3/3+"6<.E(\$.28\$5*%(,1 .

<GXGCEF@IQKQFYUEL

OFIQEUCEOG

KO,%& +38 #=E%3 \$8+"6\$+&.+\$.3 0,,(*+%"6F8 \$8+=F8 (* 8D*4 E \$%/ "6E
56\$+&.+\$.3 8D:8 #,2 D/,28 +\$ 70"\$="+,2%5"6&\$%\$6+3%"+ "6&* + "4 2O".+&(*8*4 6\$" *80*"6+"6&\$8\$OD%,8+\$".+8 .28,#+"6< #78\$6\$*R,#=".(,1 . A*%"=(H&8*+\$", %2>("+.E4
.+,OF8 (inverter), 3 \$8+"6\$+&.+\$.3 +,2 +%,O,0,+"6,1 6\$=:07,2 , 3 +%,#,#,73.3 (*O<.,8
*78\$" \$#\$%\$7+3+3+:8 20%\$2="6F85%\$(F8 \$8\$%%<O3.346\$" 6\$+&>="U345"\$ 6\$" 3
0"\$.180*.3 (* +, .1.+3(\$ \$2+,\$+).(F8 . A*%"=(H&8*+\$"*#7.34 3 \$#,&6%28.3 +:8
2O".+&(*8:8 \$8+=F8 , 6\$>\$%".(<4 6\$" 3 #%,*+,"(\$.7\$ +,24 5"\$ (\$6%& \$#,>E6*2.3 (*
H&.3 + "4,0357*4 +,2 6\$+\$.6*2\$.+E 6\$" 3 (*+\$O,%& +34.* /F%, \$#,>E6*2.34 *8+<4+34
SSG ID=,4 #*%"=(H&8*+\$"6&>* 2="6< 6\$" ("6%,X="6<5"\$ +38 ,%>E *56\$+&.+\$.3 +:8
\$8+=F8 6\$>F4 6\$" , " %5\$.7*4\$%/ "6E4%1>(" .34, 0,6"(E4 6\$" >D.34 . * =*"+,2%57\$+,2
*R,#=".(,1 6\$" *6#\$70*2.34 #%,,:#"6,1 .

0EOIQAXFGIJEU?

" \$8+=7*4>\$ *78\$" (* 0"&O%\$5(\$\$#< PTFE & D(H,=, %2>("M<(*834#\$\$/,E4. P
0,,(*+%,1(*83 #\$\$/,E (#,%*7 8\$ %2>("+.7\$#< 10! 100% (D.: inverter.

I\$ 2="6& 6\$+\$.6*2E4 +:8 \$8+=F8 6\$>F4 *#7.34 6\$" +:8 .:=38F.*:8 6\$" +:8
*R\$%+3(&+:8# ,2 + "4.28,0*1,28 , >\$ #D#*8\$ *78\$6\$+&==3=\$"\$+, \$8+=,1(*8, 25%<6\$" +
+ "4*#"6%\$+,1.*4 #*%"H\$==,8+"6D28>E6*4.

"XSFE@IQ_LTSFIXC_L

OFIQUEUCEOG

KO,%& +38 #=E%3 #%,(E>*\$, (*+\$O,%&, +,#,>D+3.3 , 6\$" *56\$+&+\$.3 .
="+,2%5"6E0"\$180*.3 (* +,8 2O".+&(*8, E 8D, 3=*6+%,=,5"6<*R,#="(< .+*5\$8F8
O:+"."6F8 .:(&+:8 ,%,OE4 LED, +1#,2 .6\$O&6". K8+"6\$+&+\$.3 +:8 2O".+&(*8:8
O:+"."6F8 (* 8D\$ #,2 D/,28 #\$\$%<("\$ ="+,2%5"6&\$%\$6+3%".+6&S6+<4\$#< +38 #=E%3
56\$+&+\$.3 +:8 8D:8 O:+"."6F8 , #%="\$(H&8*+\$6\$" 3 \$8+"6\$+&+\$.3 +,2 +%,O,0,+6,1
6\$=:07,2 (D/%" +,8 #78\$6\$ +%,O,0,.7\$4 (<#,2 \$#\$"+*7+\$" A*%="\$(H&8*+\$"*#7.34 3
\$#,(&6%28.3 +,2 2O".+&(*8,2 O:+"."6,1 , , 6\$>\$%".(<46\$" 3 #%,*+,"(\$7\$ +,2 5"\$(\$6%&
\$#,>E6*2.3 (* H&.3 +4 ,0357*4 +,2 6\$+\$.6*2\$.+E 6\$" 3 (*+\$O,%& +,2 .*/F%,
\$#,>E6*2.34 *8+<4+34 SSG ID=,4 #*%="\$(H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$+38 ,%>E
*56\$+&+\$.3 +,2.

0EOIQAXFGIJEU?

I, O:+"."6< >\$ D/*" 028\$+<+3+\$+,#,>D+3.34 .+38 ,%,OE E \$8\$%+F(*8,, >\$ *78\$"
+1#,2 LED .+*5\$8< (D5".+34 "/.1,4 70W (* >*(%,6%\$."\$ /%:(\$+,4 4000K, Ra>80,
0"\$+\$.*:8 #*%#"#,2 1,50x0,15m ="+,2%57\$4230Volt. I, O:+"."6< >\$ OD%**5513.3 5
*+F8 6\$" */*" :O*="(3 M:3 +,2=\$/".+8 50.000 :%*4 ="+,2%57\$4* \$#<0,.3 (*5\$=1+*%3
\$#< +, 80% +34 \$%/6E4O:+"*8E4 %,E4 (#%<+2#, L80B10). I, driver >\$ D/*" *5513.3
50.000 F%*4 ="+,2%57\$4I, O:+"."6< >\$ #D#*8\$ 0"\$>D+*".F(\$ 6\$" 6&=2((\$ \$#<
\$2+<.H3+, polycarbonate 6\$+35,%7\$4/2, \$8+\$25\$.+E%\$H&.3 +:8 ,%5&8:8 D8\$2.34 \$#<
\$+.&="83 =\$(%78\$ 5\$=H\$8".(D83 *8 >*(F, 6="#4 \$#< polycarbonate 6\$" 5&8+M,24
\$8&%+3.34\$#< \$+.&=". S#7.34 3 \$#<0,.3 +,2 O:+"."6,1 #D#*8\$ *78\$"+,2=&/".+8
10.300 Lumen *8F 3 \$#<0,.3 +34#35E4(LED) 8\$ *78\$"+,2=&/".+8 11.850 Lumen (.+24
65 , C). ID=,4 , 6\$+\$.6*2\$.+E4 +:8 O:+"."6F8 #D#*8\$ 0"\$>D+*ISO 9001:2015 6\$" ISO
14001:2015 6\$" +, O:+"."6< 8\$ 0"\$>D+*"CE 6\$" ENEC 6\$+' *=&/".+8 +, driver 6\$" 3
#=\$6D+\$(module) LED. H\$>(<4 #%,+\$.7\$4 >\$ #D#*8\$ *78\$IP65. A*%="\$(H&8*+\$6\$" 3
*%5\$.7\$#,2 >\$ \$#\$"+3>*75"\$+38 \$O\$7%*.3+2 #\$=\$",1 O:+"."6,1 .

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KO,%& +38 #=E%3 #%,(E>*\$, (*+\$O,%&, +,#,>D+3.3 , 6\$" *56\$+&+\$.3 .
=*"+,2%5"6E0"\$180*.3 (* +,8 2O".+&(*8, 3=*6+%,5"6< *R,#="(< ".+F8 O:+".(,1
(E6,24 9m, 6\$>F4 6\$"H%\$/"<8:8 O:+".(,1 6\$+&==3=,2(E6,24 6\$" O:+".+6F8 LED,0"6,1
O:+".(,1 . K8+7.+,"/\$.+"4 5:87*4 +:8 6+"%7:8>\$ +,#,>*+3>,18 5:8"\$6,7 H%\$/"7,8*4(*
O:+".+6" LED+1#,2 #%,H,=D\$ K8+"6\$+&+\$.3+:8 2O".+&(*8:8 O:+".+6F8 (* 8D\$(<#,2
2#&%/,28), #,2 D/,28 +\$ =*"+,2%5"6&/%\$6+3%".+68#,2 \$8\$OD%,8+\$.+8 .28,#+"6<
#78\$6\$ *R,#="(<1 . S6+<4 \$#< +38 #=E%3 *56\$+&+\$.3 +:8 8D:8 O:+".+6F8 ,
#*%="\$(H&8*+\$"6\$" 3 \$8+"6\$+&+\$.3 +,2 +%,O,0,+6,1 6\$=:07,2 (D/%" +,8 #78\$6\$
+%,O,0,.7\$4 (<#,2 \$#\$"+*7+\$" A*%="\$(H&8*+\$"7.34 3 \$#,&6%28.3 +,2 2O".+&(*8,2
O:+".+6,1 , , 6\$>\$%".(<4 6\$" 3 #%,*+,"(\$7\$ +,2 5"\$ (\$6%& \$#,>E6*2.3 (* H&3 .+"4
,0357*4+2 6\$+\$.6*2\$.+E 6\$"3 (*+\$O,%&+2 . * /F%, \$#,>E6*2.34 *8+<4+34SSG ID=,4
#*%="\$(H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$+38,%>E*56\$+&+\$.3 +,2.

;+38 \$835(D83 +(E #*%="\$(H&8*+\$"2+<(\$+3 D8\$2.3 / .HD.3 +:8 O:+".+6F8
.:(&+:8 \$#< +, .1.+3(\$ \$2+,\$+").(,1 +34SSG +, #,7, >\$ *\$8\$#%,5%\$(((\$+."*7 (*
/%,8,#%<5%\$(((\$ (* <=*4+"4\$#%\$7+3+*6\$=:0"F.*"4 6\$" .280D.*"4, 6\$>F4 +38 #%,(E>*\$
6\$" *56\$+&+\$.3 O:+,61++%,2 +, #,7, *\$7.34 >\$.280*>*7 (* +, .1.+3(\$ \$2+,\$+").(,1 .

\SFIXFIQA G[IQGH TSFIXCGh

I, O:+".+6< ,0,O:+".(,2 LED >\$ *78\$"0\$+&.*:8 #*%7#,2570-600mm x 380-
400mm "./1,4 D:4 100W (* >%(,6%\$.7\$ /%F(\$+,4 4000B, CRI > 70, \$#<
/2+,#%*. "\$%".+< 6%&(\$\$=,2("87,2, (* /\$(3=E #*%*"6+<+3+\$ /\$=6< 6\$" 2U3=E \$8+,/E
+"4 6\$"%"6D48>E6*4, H\$((D8, 3=*6+%,.++"6&.* /%F(\$ silver (RAL 9006), (* #+*%15"\$
U1R34.+ , *\$&8: (D%,4+2 .F(\$+,4 . m\$ 0"\$>*+"%2>("M,(*8,, (* .+\$>*, H3(\$.2.+3(\$
+,#,>*+3.34 \$#\$2>*"\$4 . * ".+, N46mm *:4 N76mm 3 . * H%\$/"8\$ N46mm *:4 N76mm
6\$" 6&=2((\$ \$#< #2%7(\$/, 52\$=7 #&/,24 4mm DR+%\$O\$8D4 m\$ D/" #%,+\$.7\$
.+*5\$8<+3+\$4]g 66, \$8+,/E D8\$8+"6%,1.34 IK09, 6=&.3 (<8:.34 CLII 6\$" #%,+\$. "\$
8\$8+" 2#%+\$.*:8 +,2=&/" .+,8 6kV. P \$#<0,3 +:8 led #D#*"8\$ *78\$"+,2=&/" .+,8
15.000 lm 6\$" +,2 O:+".+6,1 +,2=&/" .+,8 12.500 lm. m\$ 0"\$>D+*"8:(\$+: (D8,
3=*6+%,8"6<driver 2U3=E4\$#<0,.34 6\$" \$8+,/E4, 6\$+&==3=,5"\$/%E.3 . * R:+"%"6</F%, .
P #35E O:+<4 >\$ \$#,+*=*7+\$" \$#< 6,%2O\$7\$4#, "<+3+\$4 LED +,#,>*+3(D8\$. * +2#:(D8,

616=:(\$ \$ # < \$ =,2(78", 2U3=E4 >*("6E4 0"&/2.34 MCPCB(Metal Core Printed Circuit Board). I, O:+"."6< >\$ D/*" *5513.3 5 *+F8 6\$" :O*="(3 M:3 +,2=\$/" .+,8 100.000 :%*4 =*" +,2%57\$ \$ \$ # < 0,.3 (*5\$=1+*%3\$ # < +, 85% +34\$ \$/"6E4O:+"*8E4 %,E4(#%<+2#,L85).
6\$+\$\$.6*2\$.+E4 +:8 O:+"."6F8 # %D#*8\$ 0"\$>D+*"ISO 9001:2015 6\$" ISO 14001:2015.
I, O:+"."6, >\$ */*" .3(\$8.3 .2((,%O:.34 CE , #".+,#,"3+"6, *56%".34ENEC6\$" ENEC PLUS6\$" >\$ *8\$".2(O:8, (* +,24 *2%:#\$q6,14 6\$8,8".(,14 Sb 60598-1, Sb 60598-2-3 6\$>:4 6\$"(* +, #%,+2#, O:+,H",=,5"634 6\$+\$==3=,+3+\$4Sb 62471.

\SFIXFIQA FhNGMN@GZGYK?

I\$ O:+"."6& >\$ *78\$"#%,H,=*74LED *R:+"%6,1 /F%,2 0"\$+&.*:8 #*%7#,2300-350m x 300-350mm "./1,4 D:4 95W (* >*(,6%\$.7\$/%F(\$+,4 4000B, CRI > 70, .F(\$ \$ # < /2+,#%*. \$ %".+< 6%&(\$ \$ =,2("87,2 H\$((D8, 3=*6+%,.++\$+"6&.* /%F(\$ silver (RAL 9006), H&.3 .+E%"R34\$ # < 5\$=H\$8".(D8, \$+.&=" . * /%F(\$ silver (RAL 9006) 6\$" 6&=2((\$ \$ # < #2%7(\$/, 52\$=7#&/,24 5mm DR+%"\$O\$8D4P #%,.+\$.7\$.+*5\$8<+3+\$4# %D#*8\$ *78\$"]g 66. P \$ # < 0,.3 +,2 O:+"."6,1 # %D#*8\$ *78\$"+,2=&/" .+,8 10.500 lm. P 0D.(3 O:++<4 # %D#*8\$ *78\$"\$1((+*%3 . # %,H,=D\$4>\$ D/*" *5513.3 5 *+F8. 6\$+\$\$.6*2\$.+E4 +:8 O:+"."6F8 # %D#*8\$ 0"\$>D+*"ISO 9001:2015 6\$" ISO 14001:2015 6\$" +, O:+"."6< 8\$ 0"\$>D+*CE6\$" #".+,#,"3+"6< D56%".34ENEC.

YE^IQK@?MOGGOIXCGh

OFIQUEUCEOG

P # \$ %,1.\$ \$ O,%&+38 # =E%3#%,(E>*" \$, (*+\$O,%&, +,#,>D+3.3 , 6\$" *56\$+&.+\$.3 . * # =E%3=*" +,2%57\$ \$ =*R"6*%\$18,2,8".(,1 \$670\$4*6#,(#E4 # %F"(,2 ,/*+,1 .

S#7.34#*%"= \$(H&8*+\$3 0"\$(<%O:.3 # %, .+\$.7\$4 \$ # < H3(\$+"6D4&.*"4 # =3.7,8 +,2 5*":+E .1(O:8\$ (* +"4,0357*4+,2 6\$+\$\$.6*2\$.+E .

ID=,4 #*%"= \$(H&8*+\$6&>* 2="6<6\$" ("6%,X="6<5"\$+38,%>E *56\$+&.+\$.3 +,2 8D,2 *R,#=".(,1 . S80**"6+"6&\$8\$OD%,8+\$";O"56+E%*4(*+\$=="6D4#"8\$670*4*7:.34 , \$5:5,7 N8, 5*":+D4 +1# ,2 «S» E 3=*6+%,<0"\$5*7:.34 , ".+<4 1U,24 12m (* .+3%75(\$+\$ H&.3 ".+,1 , 6*O\$=E .:=38: +& .+*=D/3, \$670\$

%ET?Y` N@RICGMGJEFGh

P 6*O\$=E (* H&.3 +\$ \$#,+*=D.(\$+\$ +:8 *%5\$.+3%"\$6F80,6"(F8 +34 H&.*" +,2 Z\$=="6,1 A%,+1#,2 NF C 17-102 >\$ #%%D/*" \$6+78\$#%,.+\$.7\$4 >100m, 5"\$.+&>(3 #%,.+\$.7\$4 IV 6\$" 2U,(*+% "6E 0"\$O,%&5m. l, .28,="6< 1U,4 +,2 \$=*R"6*%\$18,2>\$ \$8D%/*+\$. " 13 m, #%,6*" (D8,2 8\$ #%%D/*+\$ "3 \$\$\$"+,1(*83 \$6+78\$#%,.+\$.7\$4. ".+<4 >\$ *78\$"6\$+\$.6*2\$. (D8,4 5"\$ \$8+,/E . * \$8*(,#"D.*"4 . * +\$/1+3+\$ \$8D,(2 33m/s H&.*" +:8 S2%:#\$q6F8,035"F8.

P 6*O\$=E >\$ 0"\$>D+*" +38 +*/8,=,57\$ RodCheck (Visual strike indicator). ?* +, RodCheck#%%D/*+\$ "3 #=3%,O,%7\$5"\$+, * &8 +, \$=*R"6D%\$28D/*" 0*/+*7 &(*., 6*%\$28"6< #=E5(\$ (* +38 H,E>*" \$ (7\$4 ,#+ "6E4 D80*"R34P ,#+ "6E D80*"R3>\$ O\$78*+\$ "\$#< (*5&=3 \$\$\$<.+\$.3 6\$" >\$ *78\$"8\$58:%7."(3 \$6<(\$ 6\$" \$\$\$< (3 *R**0"6*2(D8\$&+,(\$.

P 6*O\$=E >\$ D/*" #*%&.*" <=*4 +"4 0,6"(D4 <#:4 \$\$\$"+,18+\$" \$\$\$< +38 +*=%2+\$7\$ D60,.3 +,2 #%,+1#,2 NFC 17 102: 2011. ;3(*"F8*+\$" <+" 3 D60,.3 +,2 2011 *78\$" \$2.+3%<+*%3D8\$8+" +34 #%,35,1(*834 +<., . * ./0"\$+."6< *#7#*0, <#:4 #/ (* +38 \$\$\$7+3.3 5"\$2 \$5:5,14 6\$><0,2 . * 6&>* \$=*R"6D%\$28<., 6\$" .+"4 0,6"(D4 #,2 #D#*8\$ D/,28 #*%&.*" , " 6*O\$=D4+:8 \$=*R"6*%\$18:8*6#,(#E4 #F"(,2 ,/*+,1 , <#:4 #/ \$\$\$7+3.3 5"\$0,6"(D4 . * 6*%\$28"6</%*1(\$ 100kA.

;1(O:8\$ (* +38 \$\$\$7+3.3 +34 #%%\$5%&O,2C2.1.1 +,2 #%,+1#,2 NFC 17102: 2011 5"\$ =<5,24 \$.O&=" \$4 #&8: . * 6&>* 6*O\$=E (ESE *6#,(#E4 #F"(,2 ,/*+,1) >\$ \$8\$5%&O*+\$", <8,(\$ +,2 6\$+\$.6*2\$.+E , 3 /F%\$ 6\$+\$.6*2E4, serial number & VI .

P \$8+,/E +,2 \$=*R"6*%\$18,2.* .6<83 6\$" 8*%>>\$ D/*" \$\$\$<=2+3 ./D.3 (* +38 ..+E =*" +,2%57\$,2 +38 .+"5(E #,2 >\$ /%*"\$.+*7. P 6*O\$=E>\$ 6\$+\$.6*2&M*+\$ "\$#< 2="6& \$8>*6+"6&#,2 #%%D/,28 +, (D5".+, IP 67 .+, >D(\$ +34 \$8+,/E4, *R\$.O\$=7M,8+\$4D+." \$\$\$<=2+3 #%,.+\$.7\$ \$\$\$< +3 .6<83 6\$" #%,.+\$.7\$ \$\$\$< #+F.3 8*%,1 \$\$\$< <=*4 +"4 6\$+*2>18.*"4, \$\$\$< %7U3*%,1 2#< #7*.3 \$\$\$< <=*4 +"46\$+*2>18.*"4, \$\$\$< %7U3*%,1 2#< #7*.3 ".,018\$(3 (* >\$=&.." \$ 61(\$+\$ \$6<(\$ 6\$" \$\$\$< *#"%%,D4H1>".34. m\$ #D#*8\$ D/*" 0,6"(\$+*7 6\$" 8\$ =*" +,2%5*7\$R"<#" .+\$ \$6<(\$ 6\$" . * \$6%\$7*46\$+\$.+&.*"4 (>*%,(6%\$.7\$ ("6%<+*%\$ \$\$\$< -20°C (*5\$=1+*%3\$\$\$< +60°C 6\$>F4 6\$" +\$/1+3+\$ \$8D,(2 (*5\$=1+*%3\$\$\$< 120km/h). V* >\$ OD%*%\$0"*8*%5&="6& m\$.28,0*1+\$" \$\$\$< *5513.3 2 *+F8.

" 6*O\$=D4>\$ OD%,28,#+ "6E D80*"R3#E5(\$+,4, 6\$+\$.6*2\$. (D83 \$\$\$< \$8>*6+"6< . * 2#*%"F03\$6+"8,H,=7\$(UV), #*%7H=3(\$="6<834

_&%3.* \$2+E8+38+*/8,=,57\$ +, .1.+3(\$ *8"/1*" .3(\$8+"6& 6\$" H*="+F8*"+38
\$.O&="*\$ *56\$+\$.+&.*:8 6\$" \$8>%F#:8 6\$" #\$\$\$D/*"+3 ..+E D80*"R3\$8 +, \$=*R"6D%\$28,
D/*"/+2#3>*7\$#< 6*%\$28<6\$" \$8 *78\$"\$#\$%\$7+3+8\$ *=5/>*7 3 *56\$+&.+\$.3 .

P ,#+ "6E D80*"R3\$ 078*",#+ "6D4#=3%,O,%7*4

- 5"\$+38 D8+\$.3 +,2 6*%\$28"6,1%*1(\$+,4 #,2 D/*" 0*/>*7 +, \$=*R"6D%\$28,
- (* +38#%F+3(\$+"&
- \$6<(3 6\$" \$#< (*5&=3 \$#<.+\$.3 .

I, 6*%\$28"6</%*1(\$ 0*"681*" 6\$+&#<., *78\$"\$8\$56\$7, 8\$ #%,/:%E.,2(* . * #=E%3
D=*5/, +34*56\$+&.+\$.34 E </".

,XF_L – aAXWIXFGh

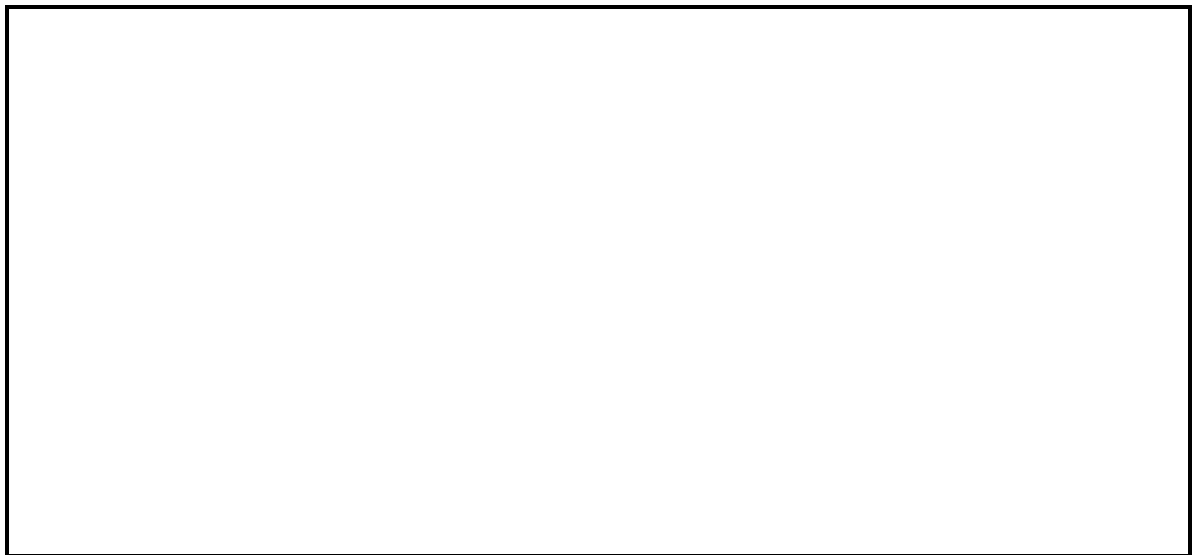
A%,6*"µD8,2 8\$ *#"+1/*" +, \$=*R"6D%\$28+38 \$\$\$"+,1µ*83 \$6+78\$#%,.+\$.7\$4, 3
\$670\$+346*O\$=E4>\$ +, #,>*+3>*7 . * 6\$+&==3=,1U,4 \$#< +, .3 µ*7, D0%\$.34+,2 ".+,1 . I,
1U,4 +,2 ".+,1 6\$>,%7M*+\$#< +\$1U3 +:8 2#< #%,.+\$.7\$ 6+"µ&+:8 6\$" 6\$+\$.6*2F8 6\$"
+,2 1U,24 +,2 .+*=D/,24 +346*O\$=E4\$=*R"6D%\$28,26#, µ#E4#%Fµ,2 ,/*+,1 , D+." F.+*
3 2U, µ*+%"6E 0"\$O,%& 6&>* #%,.++\$*2<µ*8,2 6+7µ\$+,4 :4 #%,4 +38 \$670\$ +,2
\$=*R"6D%\$28,26\$ "6\$8,#,"*7 +"4 *=&/" .+*4 \$#,.+&.*"4 Rp +,2 A78\$6\$+34 \$\$\$"+,1µ*834
;+&>µ34 A%,.+\$.7\$4.

" \$6+78*4#%,.+\$.7\$4 #,2 070,8+\$".+,8 A78\$6\$, %7M,8+\$\$\$#< +, Z\$=="6<A%<+2#,
NF C 17-102.

	)=>ABC DEFH=?HI?KI			)=>ABC DEFH=?HI?KII			)=>ABC DEFH=?HI?KIII			)=>ABC DEFH=?HI?KIV		
	30	45	60	30	45	60	30	45	60	30	45	60
h(m)	R _p (m)											
2	19	25	32	22	28	35	25	32	40	28	36	44
3	28	38	48	33	42	52	38	48	59	42	57	65
4	38	51	64	44	57	69	50	65	78	57	72	87
5	48	63	79	55	71	86	63	81	97	71	89	107
6	48	63	79	55	71	87	64	81	97	72	90	108
8	49	64	79	56	72	87	66	83	99	75	92	109
10	49	64	79	57	72	88	66	83	99	75	92	109
15	50	65	80	58	73	89	69	85	101	78	95	111
20	50	65	80	59	74	89	71	86	102	81	97	113
45	50	65	80	60	75	90	75	90	105	89	104	119
60	50	65	80	60	75	90	75	90	105	90	105	120

".+<4 >\$ *78\$" /\$=1H0"8,4, .:=38: +<4 , +3=*.6,#"6<4, *8 >*"µF
 *#"U*20\$%52%µD8,4 O=\$8+M: +,1 +1#,2. ;+38 #*%7#+:.3 ".+,1 *0%\$M*8,2 .+, D0\$O,4
 5"\$+38 #&6+:.3 +,2, >\$ 6\$+\$6*2\$.*7 H&.3 \$#\$< .62%<0*µ\$ *8+<4,%15µ\$+,4 0"\$+&.*:8
 #*%7#,22,5m µE6,24, 1m #=&+,24 6\$" 1,5m H&>,24 *8+<4 +:8 ,#,7:8 >\$ +,#,>+3>*7
 .:=E8\$4 \$8&6=3.34 – 6\$+&6="34 F.+* 8\$ *78\$"028\$+E3 \$8&6=3.3 – 6\$+&6="3+,2 ".+,1
 /:%74 8\$ \$#\$"+*7+\$5%\$8<4

S80*"6+"6E 0"\$(<%O:.3 +:8 .2.++\$+"6F8 +(3(&+:8 *8<4 ".+,1 .
 \$#,28\$%(,=<53.3 :



0EUSXWYE^IQK@?MOGM

".+<4 >\$ 5*":>*7 . * 5*7:.3 +1#,2 «S» E . * +%75:8, 5*7:.34 (* 3 3=*6+%<0"\$
 /\$=1H0"8,2 #2%E8\$*#"/\$=6:(D8,2 3=*6+%, =2+"6&#&/,4 *#"/&=6:.34 minimum 250 (m)
 0"\$ (D+%,217mm, (E6,24 1,5m, .280*0*(D8\$. * ".<#=*2%, +%75:8, #=*2%&4m, (* 52(8<
 /&=6"8, \$5:5< 0"\$+, (E4 50mm². I, +%75:8, 5*7:.34 , *O<.,8 \$#\$"+*7+\$" >\$ 5*":>*7
 ".,028\$("6& (* #\$\$\$6*7(*8, +%75:8, 5*7:.34 E>*(="6E 5*7:.3 (\$#<+\$.3 <20 m).

Z"\$ +, 0"\$6,%#".(< +,2 6*%\$28"6,1 %*1(\$+,4 .+, D0\$O,4 .1(O:8\$ (* +\$
 #\$\$\$#&8: A%<+2#\$+, .1.+3(\$ 5*7:.34 #D#*8\$ #\$\$%,2."&M*+"(E \$8+7.+\$.34 ("6%<+*%34
 +:8 10[.

d&.*" +348D\$4D60,.34 +,2 #%,+1#,2 NF C 17–102, *O<.,8 0*8 *#"+25/&8*+\$+"(E
 \$8+7.+\$.34 5*7:.34 <10[\$#\$"+*7+\$3 H*+=+7:.3 +345*7:.34 (* #%<.>*.3 3=*6+%,07,2:

- .28,="6,1 \$#\$"+,1(*8,2 (E6,4 160m, 5"\$+&>(3]
- .28,="6,1 \$#\$"+,1(*8,2 (E6,24 100m, 5"\$+&>(3]],]]] & IV

P *#".E(\$8.3 +,2 5*":+E, 5"\$+38 #%,.+\$.7\$ +,2 \$#< O>,%D4#,2 #">\$8<8\$ 2#,.+*7 \$#< *6.6\$OD4 5"\$+38 *56\$+&.+\$.3 &==:8 2#<5*":8 *56\$+\$.+&.*:8 , #5\$(\$+,#,"*7+\$"(* + "4 *"0"6D4#"8\$670*4.E(\$8.34 . " 6*O\$=D4 +:8 3=*6+%,07:8 #%,.++\$*1,8+\$" *8+<4 #=\$.+ "6F8 O%*\$+7:8

ID=,4 5"\$+38 \$#,O25E *#"678028:8 H3(\$+"6F8 +&.*:8 #D#*8\$ 2#&%/""#"6&=2U3 +:8 .3(*":6F8 5*":+F8 (3=*6+%,07:8 +% "5F8,2 5*7:.34) . * \$6+78\$3 (D+:%:8 (* /\$=76" #&/,24 +,2=&/" .+8 15cm. SO<.,8 *56\$+\$.+>*75*":+E4 +1#,2 "S" .+3 H&.3 +,2 ".+,1 6\$" 51%: \$#, +,8 ".+< >\$ 6\$+\$.6*2\$.+*7 3 #5\$5\$#&8: .+%F.3 #%,.+\$.7\$4.

;GINA E^?@F`C?F?

m\$ #D#*"+\$ =,"#& 2="6&#,2 +38 .28>D+,28 8\$ *78\$"0,6"(\$.(D8\$.1(O:8\$ (* +\$ "/1,8+\$ #%<+2#;\$;256*6%")(D8\$

- _&=6"8,4\$5:5<4 6\$><0,2: V,6"(\$.(D8,4 .1(O:8\$ (* +, #%<+2#, SG I Sb 62561-2

- ;+3%75(\$+\$5:5,1 6\$><0,2: V,6"(\$.(D8\$.1(O:8\$ (* +, #%<+2#, SG I Sb 62561-4

- k="6&.2.+E(\$+,4 5*7:.34 (\$5:5,7 , 5*":+D4): V,6"(\$.(D8\$.1(O:8\$ (* +, #%<+2#, SG I Sb 62561-2

"NIJER@WXW-)MOF`@WXW

;1(O:8\$ (* +, Z\$=="6<A%<+2#, NF C 17-102, #5\$&5%\$O,48.2, , #*%",0"6<4 D=*5/,4 +346*O\$=E46\$" <=34+34 *56\$+&.+\$.34 .28".+&+\$" 8\$ #5\$(\$+,#,"*7+\$"\$8& 1 D:4 3 /%<8"\$8&=,5\$ (* +3 .+&>(3 #%,.+\$.7\$4 6\$" +, #*%"H&==,8#,2 H%7.6*+\$3 *56\$+&.+\$.3 (#", .2/8& . * #", 0"\$H%:+"6D\$+(<.O\$"%*4).

;256*6%")(D8\$"/1,28 +\$ +,2 #5\$5\$6&+: #78\$6\$

!"%&()*+!#-.#0	13/%45*(-(	)78*(0 13/%45*(-(	9*.-/&40 1;<#!#-"-4/0)78*(0 13/%45*(-(
=& II	<"%41 ?*@A+	<"%42 ?*@A/#	<"%41 ?*@A+
=& IV	<"%42 ?*@A/#	<"%44 ?*@A/#	<"%41 ?*@A+

S#"#=D,8 3 6*O\$=E 6\$" ,=<6=3%33 *56\$+&.+\$.3 >\$ #D#*8\$ *#">*: %*7+\$"<+\$8 3 #%,.++\$*2<(*83 6\$+\$.6*2E +%,#,#,"*7+\$", *#"6*2&M*+\$"E D/" 0*/>*7 &(*., 6*%\$28"6< #E5(\$.

? "\$ *56\$+&+\$.3 \$=*R"6D%\$28,2#%F"(,2 ,/*+,1 (#,%*7 8\$ \$#=#D.*" +38
 \$#,+*=(.\$+"6<+3+& +34 .+3 0"&%6*" \$+,2 /%<8,2 \$#< 0"&O,%\$ \$7+"\$<#:4 ,R*"0F.*"4,
 0"\$H%F.*"4,O*"=<(*8*4 . * 02.(*8*74 #*%"H\$==,8+"6D48>E6*4, . * (3/\$8"6D4 6\$+\$#,8E.*"4
 E 6*%\$28"68=E5(\$+\$, \$6<(3 6\$". * 2#*%H,="6E%1# \$8.3 +346*O\$=E4+,2 \$=*R"6D%\$28,2
 #,"\$0E#,+* .O&=(\$+\$ 0"\$#" .+:>,18 6\$+&+3 0"&%6*" \$34 *# ">*F%3.34, >\$ #%D#*"
 8\$ 0",%>:,>,18 <., +, 028\$+<8 5%35,%<+*%\$F.+* 8\$ 0"\$+3%3>*7 6\$=1+*%3028\$+E
 \$#,+*=(.\$+"6<+3+\$ +34*56\$+&+\$.34.

i@V?O? \$E|UGM

OFIQEUCEOG(CKF@WXWYMCKOGMG^MV_OGM?I ?IS@GhCEOSXFE@ER)O
 KO,%&+38 #=E%3*56\$+&+\$.3 ,(&0\$4 4 ,%5&8:8 (D+%3.340"\$=2(D8,2 ,R25<8,2
 (LDO) 6\$" 4 ,%5&8:8 (D+%3.34\$":%,1(*8:8 .+*%*F8 (MLSS) #,2 +,#,>+*,18+\$" . * 6&>*
 (7\$ \$#< +"4 0*R\$(*8D4 \$*%".(,1 (* +,24 \$8+7.+,"/,24 *=*56+D4 6\$" 6\$=:0"F.*"4 .
 A*%="\$ (H&8*+\$"3 #=E%34*56\$+&+\$.3 +,2 *R,#=".(,1 (* .2.+E(\$+\$.+E%"R34+:8
 ,%5&8:8 #,2 >\$ *78\$"*56*6%"(D8\$ \$#< +,8 6\$+\$6*2\$.+E +,24 6\$" +\$ \$#\$"+,1(*8\$ (E63
 6\$=:07:8 5"\$ +3 .180*.3 \$".>3+3%7:8*=%56+F8 6\$" *=*56+F8+,#"6F8 (,8&0:8
 \$2+,\$+").(,1 . S#7.34 #*%="\$ (H&8*+\$"3 \$#\$"+,1(*83 \$%/"6EH\$>,(8<(3.3 6\$" %2>(7.*"4
 ,%5&8:8 6\$>F4 6\$" 3 D8\$%R3*"+,2%57\$4,24 6\$" 3 *R\$.O&=" .3 +34 *# "6,"8:87\$4 (* +38
 +,#"6E (,8&0\$ \$2+,\$+").(F8 6\$" 3 *6#\$70*2.3 #%,.:#"6,1 . ID=,4 #*%="\$ (H&8*+\$"6\$" 3
 56\$+&+\$.3 \$#\$5:5D:8 2#%+&.*:8 (SPD's) . * 6&>* 5%\$((E .E(\$+,4 5"\$ #%,.+\$7\$ +:8
 ,%5&8:8 6\$" +:8 *=*56+F8 \$#< 6*%\$28"6D4#*%+&.*"4

OFIQEUCEOG(WYEQF@GC?VOWRQ@GJ_CEF@CYEIXFGH?VSVGh)
 KO,%&+38 #=E%3*56\$+&+\$.3 3=*6+%,(\$583+"6F8#\$%,/(D+%:8 6\$+&==3=:8 5"\$
 =1(\$+\$ (* +,8 \$8+7.+,"/, *=*56+E6\$" 6\$=:0"F.*"4 .+\$ \$6<=,2>\$.3(*7\$ +34SSG
 . ;+,8 6\$+\$>="#+"6\$5:5< +:8 \$8+= "F8\$8\$626=,O,%7\$4\$8&("6+,2 25%,1 (2 +*(&/"\$)
 . ;+,8 6\$+\$>="#+"6\$5:5< +:8 \$8+= "F8\$8\$626=,O,%7\$48*%5,1 "=1,4 (2 +*(&/"\$)
 . ;+,8 6\$+\$>="#+"6\$5:5< +:8 \$8+= "F8"=1,4 #%,4 *#*R*%5\$.7\$2 +*(&/"\$)

A*%="\$ (H&8*+\$"3 #=E%34*56\$+&+\$.3 +,2 *R,#=".(,1 (* *56\$+&+\$.3 0"6=*70:8
 \$#,<8:34 (*=\$+."6E4 D(O%\$R346\$+&==3=:8 5"\$ =1(\$+\$) 6\$" .2+,="6F8 +*(\$/7:8
 (*O<.,8 \$#\$"+,18+\$) \$8&8+3 6\$" 6\$+&8+3+,2 #%,/(D+%2, 6\$>F4 6\$" +\$ \$#\$"+,1(*8\$

(E63 6\$=:07:8 5"\$ +3 .180*.3 *=*56+E+,#"6E4 (,8&0\$4 \$2+,\$+).(F8 . S#7.34 #*%="\$(H&8*+"\$3 \$#\$"+,1(*83 \$\$/ "6E H\$>(<3.3 6\$" %2>(7.*"4,%5&8,2 6\$>F4 6\$" 3 D8\$%R3="*,2%57\$+,24 6\$" 3 *R\$.O&="*.3 +34 *#"6,"8:87\$4 (* +38 +,#"6E (,8&0\$ \$2+,\$+).(F8 6\$" 3 *6#\$70*2.3 #%,..#"6,1 .

OFIQUEUCEO&(CEF@WF`pH)

KO,%& +38 #=E%3*56\$+&.+\$.3 *8<4 ,%5&8,2 (D+%3.34 pH (* +,8 \$8+7.+,"/, *=*56+E 6\$" 6\$=:0"F.*"4 . A*%="\$(H&8*+"\$3 #=E%34*56\$+&.+\$.3 +,2 *R,#=".(,1 (* .2.+E(\$+\$.+E%"R34:8 ,%5&8:8 #,2 >\$*78\$"*56*6%"(D8\$#< +,8 6\$+\$.6*2\$.+E +,24 6\$" +\$ \$#\$"+,1(*8\$ (E63 6\$=:07:8 5"\$ +3 .180*.3 \$.>3+3%7,2*=*56+E 6\$" *=*56+E+,#"6E4 (,8&0\$4 \$2+,\$+).(F8 . S#7.34 #*%="\$(H&8*+"\$3 \$#\$"+,1(*83 \$\$/ "6E H\$>(<3.3 6\$" %2>(7.*"4,%5&8,2 6\$>F4 6\$" 3 D8\$%R3="*,2%57\$+,24 6\$" 3 *R\$.O&="*.3 +34 *#"6,"8:87\$4 (* +38 +,#"6E (,8&0\$ \$2+,\$+).(F8 6\$" 3 *6#\$70*2.3 #%,..#"6,1 .

0EOIQAXFGIJEU?

;+38 *8<+3+\$ #\$\$%\$+7>*8+*"0"6D4\$#\$"+E.*"4 5"\$ +\$ <%5\$8\$ #*07,2 #,2 >\$*56\$+\$.+>,18. ;256*6%"(D8\$ #%<6*"+\$5"\$ \$.>3+E%"\$(D+%3.34 0"\$=2(D8,2 ,R25<8,2 (LDO), \$":%,1(*8:8 .+*%*F8 (MLSS), #\$\$%,/E4 6="*.+,1 \$5:5,1 6\$" pH (* +,24 \$8+7.+,"/,24 *=*56+D4

IXJWF`@IG [I?YMCKOGMG^MV_OGM(LDO)

A%<6*"+\$5"\$,#+ "6< \$.>3+E%", .28*/14 (D+%3.34 .28,0*2<(*8, (* .1.+3(\$ H1>".34 6\$" \$567.+%:.34 \$#\$< \$8,R*70:+, /&=2H\$ I\$ *=&/" .+\$ +*/8"6&/%\$6+3%".+"6&

- P (D>,0,4 (D+%3.34 #+"6E -N>,%".(<(*+%"6E
- S1%,4 (D+%3.34 0,05 – 20,0mg/L (ppm) (* HE(\$ 0,01mg/L, 0,5-200% 6,%*.(
HE(\$ 0,01% 6,%*.(
HE(\$ 0,01% 6,%*.(
- S2\$".>3.7\$: ±0,05%.
- d\$>(<3.3 : V*8 \$#\$"+*7+\$"
- _%<8,4K#<6%".34(I 90): <40sec.
- S1%,4>*(,6%\$.7\$ =*"+,2%57\$40°C D:4 +50 °C
- V*8 2#&%/" #\$\$%*(#<0".3 \$#\$< +\$ \$6<=,2>\$: P₂S, pH, K⁺, Na⁺, Mg²⁺, Ca²⁺, NH₄⁺, Al³⁺, Pb²⁺, Cd²⁺, Zn²⁺, Fe²⁺, Mn²⁺, Cu²⁺, Ni²⁺, Co²⁺, CN, NO⁻, SO₄²⁻, S²⁻, PO₄³⁻, Cl⁻, Cl₂, %5< #*+%D=\$.",
- To \$.>3+E%", 8\$.28,0*1*+\$" \$#\$< U3O"\$6< 6\$=F0", (E6,24 10m, (* 028\$+<+3+\$*#D6+\$.34 \$8&=,5\$ (* +*4*#">2(7*4+,2 /*"%" .+E

- A%D#*8\$ *78\$ "D+, "(, 8\$.280*>*7 (* +,8 U3O"\$6<*=*56+E (* +,8 ,#,7, >\$ 578*+ "\$3 0"\$/*7% ".3 +:8 (*+%E.*:8 , 3 0* *56\$+&.+\$.3 +,2 8\$ *78\$ " *16,=3 6\$ " 5% E5,%3(* +*/8,=,57\$ plug'n'play.
- A%D#*8\$.28,0*1*+ "\$ \$ #< 6\$+&==3=3\$8,R*70:+3 0"&+\$R\$ " \$+38 +,#,>D+3.3 +,2 .+38 0*R\$ (*8E E +, \$8,"6+< 6\$8&="
- A%D#*8\$.28,0*1*+ "\$ \$ #< <=\$ +\$ \$ \$ \$ \$7+3+\$6%, *R\$%+E (\$+\$ " \$+3 =*" +,2%57\$,2.

IXJWF`@IG CKF@WXWLS@GhCEOSXFE@ERQMLSS)

A%<6*" +\$5"\$ \$ ".>3+E% ".28*/.14 (D+%3.34.28,0*2<(*8, (* .1.+3(\$ \$2+<(\$+,2 6\$>\$% ".(,1 , #*%7H=3(\$6\$ " .1.+3(\$ H1> ".34 \$ #< \$8,R*70:+, /&=2H\$ I\$ *=&/" .+\$ +*/8"6& /\$%\$6+3% ".+"6&

- ?D+%3.3K":%,1(*8:8 ;+*%*F8
- V"\$>D+*".1.+3(\$ \$2+,6\$>\$% ".(,1 +,2 \$ ".>3+3%7,2+1#,2 wiper ((&6+%,)
- v3O"\$6E D80*"R3-34(*+%E.*:4 .+,8 *=*56+E
- S1%,4(D+%3.34\$ #< 0,001 – 50g/l
- B\$(7\$ \$ \$7+3.3 %1> (" .3 ,%5&8,2 (calibration)
- _%<8,4\$ #<6% ".34\$ #< 1 D:4 300 sec (%2> ("M<(*8\$
- d&>,4 H1> ".34 \$ #< 0.1m D:4 60m
- fR,0,4 4-20 mA \$8&=,53 +34.256D8+%:.34
- K6%7H*"\$+%E.*:4 o 5%
- l&.3 +%,O,0,.7\$4 230 VAC/50Hz
- ?E6,4 6\$=:07,2 10m

A*%"=\$ (H&8* ".1.+3(\$ H1> ".34 \$ #< \$8,R*70:+, /&=2H\$ 5:87\$ 90°.

"YEVQF`L VI? F? ?IXJWF`@I? LDO, MLSS

A%<6*" +\$5"\$ \$ (.8&0\$ *=D5/,2 \$ ".>3+3%7:8 6\$ " .256*6% "(D8\$5"\$ U3O"\$6<*=*56+E 5"\$ +38 .2==,5E , \$ #*"6<8 ".3 6\$ " \$ #,>E6*2.3 +:8 (*+%E.*:8 , \$ #,+*=,1(*8,2 \$ #< 01, \$8*R&%+3+*(48&0*4 , \$%(.8"6&.28*%5\$M<(*8*4.* D8\$.2802\$.(D8, .1.+3(\$. I\$ *=&/" .+\$ +*/8"6&/ \$%\$6+3% ".+"6& "\$+3 (.8&0\$:

- B\$+&==3=38\$ 0*/>*7 0*0,(D8\$ \$ #< +D..*%\$ +,2=&/" .+,8 \$ ".>3+E% "(D+%3.34 +,2 "07,2 *70,24 E 6\$ " 0"\$O,%*+"6F8 #\$\$\$ (D+%:8 *8F # %D#*8\$ D/*" 6\$ " 028\$+<+3+\$ *#D6+\$.345"\$8\$ 0*/>*7 (D/%",6+F \$ ".>3+E% "\$
- f/*" +38 028\$+<+3+\$.28*%5\$.7\$4 6\$ " (* &==*4 < ("*4 (.8&0*4 5"\$ +38 03(" ,2%57\$ (*5\$=1+*%:8 0"6+1:8 (*+%E.*:8 .
- V"\$>D+*"+D..*%"4\$8\$=,5"6D4*R<0,24 0/4-20mA, 500 hm, (* 028\$+<+3+\$8\$ 0*/>*7 6\$ " &==*4\$8\$=,5"6D4*R<0,24 \$8&=,5\$ (* + "4\$#\$"+E.*"4+ ,2 /*"% ".+E

- f/" +38 028\$+<+3+\$ 8\$ 0*/>*7 +D..*%"4 \$8\$=,5"6D4U3O"\$6D4*".<0,24 5"\$ +38 +,#,>D+3.3 6\$" &==:8 2#\$/<8+:8 \$">3+3%7:8E .2.+3(&+:8 (D+%3.34
- V"\$>D+*"D..*%"4 *#\$OD4(relays) &8*2 028\$("6,1 , (* 028\$+<+3+\$#%,5%\$(((\$+").(,1 +,24 5"\$ /%E.3 :4 alarm, (* 028\$+<+3+\$8\$ 0*/>*7 6\$" &==*4 *#\$OD4\$8&=,5\$ (* +*4 \$#\$"+E.*"4+,2 /"%".+E
- f/" 028\$+<+3+\$8\$ 0*/>*7 *#"#=D,8 6&%+*4"\$ +38 *#"6,"8:87\$ (* .2.+E(\$+\$ SCADA (D.: #%:+,6<==:8 Modbus, Profibus DP, RS4856.=.#.
- f/" 028\$+<+3+\$8\$ 0*/>*7 6&%+\$2+,0"\$58:+"6,1 *=D5/,2 6\$" #%,*"0,#,73.34 5"\$ +*4 2#,*#"#<(*8*4 3(D%*4D:4 +, *#<(*8, service 6\$" 5"\$ +, *#7#*0, 6\$=E4=*"+,2%57\$4:8 \$">3+E%:8
- ;+&>(3 #%,.+\$.7\$ IP65
- S1%,4>*(,6%\$.7\$=*"+,2%57\$420· C - +55· C
- I%,O,0,.7\$: 100 - 240V AC/50-60Hz
-]./14 : 75VA

*YEQF@GC?VOWFIQ?@GJ_CEF@QY EIXFGH?VSVGh

I, 3=*6+%,(\$583+"6<#\$/<(*+%, >\$ \$#,+*=*7+\$#"#<+,8 .:=E8\$ (D+%3.346\$"+,8 (*+\$+%,#D\$ K8&8+36\$" 6\$+&8+3+,2 3=*6+%,(\$583+"6,1 #\$/<,(D+%2 >\$ +,#,>*+3>*7 H&8\$ \$#,<8:34 +,2 \$#< +,8 6\$+&=>="#+"6<.:E8\$ (6\$" <#,2 \$#\$"+*7+\$"+*(&/", *R&%(:34 , p DN150) F.+* 8\$ *78\$*16,=3 3 \$O\$7%*.E+,2 5"\$ =<5,24 .28+E%3.34.

I, #\$/<(*+%, 6\$+&8+3+34 (8&0\$4 #%,*#*R*%5\$.7\$4=2(&+:8 >\$ *56\$+\$.+\$>*7 *8+<4\$#,1+4 .+*5\$8,1 O%*\$+7,2

!\$&'&()+.\$"-\$/&1&'231"42"'-\$

K%/E?D+%3.34	: P=*6+%,(\$583+"6E*\$5:5E
?*+%,1(*83 A\$%&(*+%,4	: A\$%/E 8*%,1 E=1(\$+,4
8,(\$+."6E A7*.3	: PN16
K#\$"+E.*"4*2>15%\$((,2 +(E(\$+,4	: 5 0"\$+,(D4#%"86\$"3 0"\$+,(D4(*+& +, \$">3+E%",
m*%(,6%\$.7\$=*"+,2%57\$4#*%"H&==,8+,4	: -40 ... +70 °C
m*%(,6%\$.7\$=*"+,2%57\$4=1(\$+,4)	: -10 ... +70 °C
k="6<B\$+\$.6*2E4 #*%"H=E(\$+,46\$" O=\$8+MF8	: _&=2H\$4ASTM A 105
k="6<B\$+\$.6*2E4 .:=E8\$ (D+%3.34	: K8,R*70:+,4 /&=2H\$4AISI 304/1.4301
k="6<B\$+\$.6*2E4 3=*6+%,07,2	: Hastelloy C
k="6<B\$+\$.6*2E4 *:+*%"6E4 *#D802.34	: NBR Hard Rubber
K%/ "6Eg1>("3 (calibration)	: Zero-point, 2X25% 6\$"2X90%
d\$>(<4 #%,.+\$.7\$4	: min IP67
"#\$%&#)*	
I%,O,0,.7\$	: 115 - 230V AC, 50/60Hz / 17VA

;2/8<+3+\$ 0"D5*%.34	: 6,25Hz / 7,5Hz
K6%7H*"(D+%.3.34	: 0,4% ±1 mm/s
K8\$=,5"6EDR,0,4	: 0/4 - 20 mA, <800 [
v3O"\$6D4DR,0,"	: ;2/8<+3+\$ 0 ... 10 kHz, 50% duty cycle E A\$=(,7 (active) 24VDC, 30 mA E A\$=(,7 (passive) 3 ... 30VDC, 110 mA6\$" g*=D(*+\$5:5E4 42VAC/2A, 24VDC/1A
Z\$=H\$8"6\$#,(<8:.3	: <=*4," DR,0,"*78\$"5\$=H\$8"6\$#,(<8:(D8*4
m*%(,6%\$.7\$=*"+,2%57\$4	: -20°C ... +60 C
k="6<6\$+\$.6*2E4	: fibre glass reinforced polyamide
d\$>(<4 #%,.+\$\$.7\$4	: IP 67
><83	: N:+*M<(*83
A".+,#,"3+"6< ;2((<%O:.34	: CE, PED-97/23EG (O<.,8 D/*" *O\$%(.5E)

56\$792"" : +1":1&<: '&' =+"2761:1&

" (*+.%3+D4#\$\$%,/E4 *78\$" 3=*6+%,(\$583+"6,1 +1#,2, +1#,2 5%\$)((E4 (* O=&8+M*6\$" +\$%"&M,2\$ +, (D5*>,4 +,2 .:=E8\$ 6\$" +38 6=7(\$6\$+34 #\$\$%,/E4. P \$%/E=*"+,2%57\$4:8 (*+.%3+F8 *78\$", b<(<4 +,2 Faraday 5"\$+38 3=*6+%,(\$583+"6E *#\$5:5E , H\$."M<(*83.+ , #\$(="6< .28*/D4 (\$583+"6< #*07, 6\$" d.c. +*/8"6D4#\$(=F8 (d.c. pulse techniques). S#7.34 , " (*+.%3+D4#\$\$%,/E4 *78\$"/.*0"\$.(D8," 5"\$ /\$(3=E 6\$+\$8&=:3 (low-energy design) (* \$2+<(\$+3 (30*8"6E \$8+".&>("3 (automatic zero compensation).

P 0"\$+\$.",=<53.3 +,2 (*+.%3+E 0"\$O\$=7M* "<+" 3 +\$/1+3+\$ %,E4+,2 8*%,1 62(\$78*+\$\$#\$< 0,5m./s D:4 10.0 m/s. I, #%,0"\$5*5%\$((D8,*1%,4 #\$\$%,/E4 (*+%"D+\$" (* \$6%7H*"\$,\$+34 +&R34+,2 +0.4% +34 #%%5(\$+"6E4 (D+%.3.34 #\$\$%,/E4 6\$" </" :4 #,.,.+< *#7+34#=E%,246=7(\$6\$45"\$+\$/1+3+*4%,E4\$#< 0,5 m./s D:4 10.0 m/s.

n#,2 3 0"&(*+%,4 +:8 (*+.%3+F8 #\$\$%,/E4 *78\$" 0"\$O,%"+"6E \$#\$< +38 ,8,(\$+."6E 0"&(*+%,+ :8 \$5:5F8 >\$ /%3."(,#,"3>,18 .2.+ ,=D4 .

I, .F(\$ /\$".>3+E%",+:8 %, <(*+%:8 D+." F.+* 8\$ *R\$.O\$=7M*+\$3 ..+E .280*.(=,57\$ 6\$" +\$ \$#\$%\$7+3+\$2>15%\$(((\$ +(E(\$+\$ 5"\$ +38 *#7+*2R3.+%:+E4 %,E4 6\$" \$6%7H*"\$4+.%E.*:8 . " 3=*6+%,8"6,7(*+\$+%,#*74>\$ +,#,>*+3>,18 *7+* #&8: .+, .F(\$ +,2 %, <(*+%,2 (compact installation), *7+*.* \$#,\$(6%2.(D83 >D.3 *8+<4 2O".+&(*8,2 , "6E(\$+,4 E *%(\$%7,2+1#,2 #7=\$%* #\$\$\$#=E."\$>D.3 \$#\$< +,

.F(\$ +,2 %, <(*+%,2 (remote installation). B\$".+,24 01, #%, \$8\$O*%>D8+*41#,24
 56\$+&.+\$.34 0"\$\$.O\$=7M+\$.+*5\$8<+3+\$ +,2 *R,#=".(,1 6\$+ *=&/" .+, H\$>,(1
 #%,.+\$.7\$4 IP67. (*+\$\$+%,#D\$40*8 >\$ *56\$+\$.+>*7(D.\$. * .6&((\$ E O*%&+",+,
 ,#,7, (#,%*7 8\$ #=3((2%E.*" . ;+38 #*%7#+:3 \$2+,1 +,2 *80*/<(*8,2 >\$
 #%\$5(\$+,#,"*7+\$" \$#,(\$6%2.(D83 *56\$+&.+\$.3 +,2 3=*6+%,8"6,1 (*+\$\$+%,#D\$*8+<4
 ,"67.6,2 E #7=\$%8&=,5:8 #%,0"\$5%\$OF8\$.O\$=*7\$4 ;+38 #*%7#+:3 \$2+E +, .F(\$
 +,2 %, <(*+%,2 #,2 >\$ #%\$\$(D8**56\$+*.+3(D8, (<8, +,2 .+, O*%&+",>\$ 0"\$>D+*"
 H\$>(< #%,.+\$.7\$4 IP68.

;+38 #*%7#+:3 \$#,\$(6%2.(D834 *56\$+&.+\$.34 , " .280D.*"4 (*+R1
 \$".>3+3%7,2.F(\$+,4 6\$" 3=*6+%,8"6,1 (*+\$\$+%,#D\$#%\$5(\$+,#,"18+\$" (D.: **0"6F8
 6\$=:07:8 0"#=E4 >:%&6".34 D8\$8+" 3=*6+%,(\$583+"6F8 #%\$*(H,=F8 +\$,#,7\$
 R\$.O\$=7M,28+38 (+O,%& +,2 .E(\$+,4 /:%74 \$F=*"4.

P *56\$+&.+\$.3 +:8 (*+%3+F8 %,E40*8 *#3%*&M*+38 \$6%7H**\$34 (D+%3.34
 6\$" +3 .2(#*%"O,%& +,24 \$#< #%\$6*7(*8,24\$5:5,14 3=*6+%"6,1%*1(\$+,4 ((D.3 E
 /\$(3=E +&.3), +3=*O:8"6& 6\$=F0"\$ 6\$" &==,24 2#&%/,8+*4 \$5:5,14 8*%,1, (* H&.3
 +"4 #%,0"\$5%\$OD4b 50081-1, Sb50082-2 #,2 \$O,%18 .+38 3=*6+%,(\$583+"6E
 .2(H\$+<+3+\$.

IS .+,"/*7\$ +,2 \$".>3+3%7,2 (* <=*4 +"4 *%5,+. "\$6D4 #%,%2>(7.*"4 (#./.
 +1#,4, 6:0"6<4, 0"\$+&.*"4 +,2 \$".>3+3%7,2 %2>(7.*"4+,2 (*+\$\$+%,#D\$ #%\$&(*+%,
 H\$>,(8<(3.34 6.=.#.) \$#,>36*1,8+\$" . * **0"6E (8E(3 , F.+* . * #*%7#+:3 H=&H34
 +,2 (*+\$\$+%,#D\$8\$ #\$\$\$+*7+\$(<8, 3 \$#,\$(&6%28.3 +,2 /\$=\$.(D8,2 (*+\$\$+%,#D\$6\$" 3
 +,#,>D+3.3 8D,2 /:%74 +38 #%\$,2.7\$ *R**0"6*2(D8,2 +*/8"6,1 (" \$ 6\$" +\$ 0*0,(D8\$
 +,2 \$".>3+E%\$(*+O\$D%,8+\$"#\$< +38 **0"6E (8E(3 6\$+& +38 0"&%6**\$+34 #F+34
 66783.34+,2 (+\$\$+%,#D\$.+38 ESPROM+,2.

*R,#=".(<4 (#,%*7 8\$ =**+,2%5*7\$8*R&%+3+\$6\$" (#,%*7 8\$ +*>*7 . *
 =**+,2%57\$#7+<#2 /:%74 +3/%E.3 H,3>3+"6,1 *R,#=".(,1 0,6"(F8 E =,5".("6< .

I, .1.+3(\$ \$#,+*=*7+\$"#\$< +\$ *RE4(D%3

1) .C DEGCHGFB<>JHL@GCMBIHGJFLIHEB@OP

IS .F(\$+\$.280D,8+\$" .+, 076+2, (D.: O=\$8+MF86\$+&==3=340"&+%3.34
 \$8&=,5\$ (* +38 ,8,(\$+."6E +,24 #7*.3, #,2 0"\$>D+,28.+\$ &6%\$+,24. " O=&8+M*4

*78\$" 6\$+\$.6*2\$.(D8*4 .1(O:8\$ (* +, #%<+2#, Sb1092-1. P ,8,(\$.+ "6E #7*.3
="",+2,%57\$#N+:8 \$">3+E%:8 *78\$" 16 Bar *8F 3 #7*.3 0,6"(E4 >\$ *78\$"1,5 _ PN

I\$ #387\$ 0"D5*% .34 *O&#+,8+\$" *.:+*"6& .+38 *#"O&8"\$ *#D802.34 +,2
\$".>3+E%\$/:%74 8\$ #\$\$\$*(H&==*+\$(*+\$R1 \$2+F8 &==, 2="6< P *.:+*"6E *#D802.3
+,2 \$">3+E%\$*78\$" Hard Rubber, 6\$+&==3=,25"\$ +38 *O\$%(.5E. H 6\$+&==3=<+3+\$
+,2 2="6,1 *#D802.34 #".+,#,"*7+\$" \$#< +,8 6\$+\$.6*2\$.+E .1(O:8\$ (* +38 0E=:3
.2((<%O:..34 CE 6\$" H&.3 +:8 0"\$0"6\$."F8 #".+,#,73.34 6\$+&ISO 9001. I, 2="6<
6\$+\$.6*2E4 +:8 O=\$8+MF8180*.34 +,2 \$">3+3%7,2*78\$"/\$=1H0"8, ASTM A 105
8F ,=<6=3%, +, .F(\$ D/" *R:+*"6E*#"6&=2U3\$8+"0"\$H%:+ "6E4#,R"6E4H\$OE4
*=&/" .+,2 #&/,24 150 (m.

I, 2="6< +:8 3=*6+%,07:8 *78\$" \$#< Hastelloy 'C', 6\$+&==3=, 5"\$
.256*8+%F.*"4 /=: %7,2 2 mg/l.

2) 0<>JHL@BNGQFCHL@;-GPI>RO8CLCJHILNDHINJT

_ %3."(, #,"*7+\$" (*+\$+%,#D\$4#\$("6,1 .28*/1,14 (\$583+"6,1 #*07,2 , , #,7,4
8+&..+\$" *16,=\$. * .1.+3(\$ +3=(*+%7\$4* +38/%E.3 6\$+&==3=:8.280D.*:8 .

(*+\$+%,#D\$40"\$>D+*"D80*"R35"\$ +38 .E(\$8.3 +34 6\$+&.+\$.34 +,2 \$5:5,1
<+\$8 \$2+<4 *78\$"&0*",4 (empty pipe detection) 6\$>F4 6\$" *#\$OE, *=*1>+%34+&.34
(D.: +34 , #,7\$4 >\$ (#,%*7 8\$ 078*+\$(E82(\$ #%,4 &==\$.2.+E(\$+\$ +3==D5/,2.
S#7.34 0"\$>D+*"R*/: %".+E D80*"R35"\$ +38 \$8\$55*=7\$.O\$=(&+:8 <+\$8 \$2+&
\$8"/8*1,8+\$" \$#< +\$ \$2+,0"\$58:..+ "6& +,2 (*+\$+%,#D\$;+"4 #*%7#+:.*"4 <#,2 ,
(*+\$+%,#D\$4.E(\$+,4 +, #,>*+7+\$" . * \$#<.+\$.3 \$#< +,8 \$">3+E%\$3 \$87/8*2.3 +34
6\$+&.+\$.34 "6*8<4\$5:5<4" *78\$"028\$+E.* \$#<.+\$.3 D:4 6\$"50 (D+:%:8.

" (*+\$+%,#*74D/,28 028\$+<+3+\$+34 (D+%3.34+34 #\$\$%./E4 6\$" #%,4 +"401,
6\$+*2>18.*"4 6\$" 0"\$>D+,28(7\$ \$8\$=,5"6E DR,0, 6\$" U3O"\$6E*#\$OE 3 , #,7\$ (#,%*7
8\$ #%,5%\$((+\$".>*75"\$+38 (*+&0,.3 +34#=3%,O,%7\$46\$+*1>28.3 %,E4 (forward-
reverse) #%,4 &==\$.2.+E(\$+\$ +3==D5/,2. B&>* (*+\$+%,#D\$4OD%**8.:(\$+: (D83
O:+"M(<*83 \$=O\$%)>(3+"6E><83 3 5%\$((F8 6\$" #=36+%,=<5", P #%F+35%\$((E +34
,><834 \$#"6,87M*#&8+\$+38 +%D/,2.\$ #\$\$%./E . * m3/h E l/s, E +3 .28,="6E %,E
*8F 3 0*1+*%36\$" 3 +%7+3%\$((E >\$ #%,5%\$((+\$".+ ,18 \$8&=,5\$ (* +"4\$#\$"+E.*"4
+,2 +*="6,1 /%E.+3 078,8+\$4#=3%,O,%7*46\$" (381(\$+\$ (#./ . %2>(7.*"4 ,%5&8,2,
.O&=(\$ (*+%3+H.

;* #*%7#+:1.3 .O&=(\$+,4 , , (*+\$+%,#D\$4 \$#"6,87M*" +,24 6:0"6,14
.O\$=(&+:8 (* .28,#+ "6E #*%"5%O\$E\$" *2\$8&58:.*4 #%,+&.*"4 5"\$ +38 0"<%>:..E
+,24. S#7.34 #%,H=D#*+\$0"\$0"6\$.7\$#%<.H\$.34 (D.: 6:0"6,1 \$.O\$=*7\$4 5"\$ 8\$
\$#,+,%D#*+\$3 (3 *R,2.",0,+3(D83 \$==5E+:8 #%,6\$>,%".(D8:8 #\$\$\$(D+:%:8

P ,><83 #\$\$D/*":4 *=&/".+, +\$ \$6<=,2>\$:

§ S(O&8".3 .+"5("\$7\$4%,E4(6\$"6\$+&+"401, 0"*2>18.*"4)
§ S(O&8".3 \$>%,."+"6E4%,E4(6\$"6\$+&+"401, 0"*2>18.*"4)
§ S(O&8".3 +340"\$O,%&4+38 \$>%,."+"6E%,E 5"\$+"401, 0"*2>18.*"4
§ A=3%,O,%7*4"&58:.34
§ ;28>E6*4 6*8,1 \$5:5,1

13.-(0 + (74<!"+A/<@&4!#!"+3C#0 37(*. !# 3##<"!6 :
§ ;256%\$+*7+\$.E(\$+\$ *R<0,2 5"\$%2>("M<(*8,/ %<8,.
§ V"\$>D+*02, \$8*R&%+3+,2\$>%,."+D4(totalizers) 5"\$+38 #\$\$6\$,=,1>3.3 6\$"
\$#,(83(<8*2.3 +,2 .28,="6,1 <56,2 +,2 8*%,1 .* 02, 0"\$O,%*+"6D4
/,%8"6D4#*%"<0,24(#./ . /"*(F8\$ -6\$=,6\$7%)
§ f/*" #=E%3="*,+2%57\$2+,0"&58:.34 .O\$=(&+:8 .
§ #%,5%\$(((\$+").(<4 +,2 (*+\$+%,#D\$ 578*+\$"\$#< +, #=36+%,=<5"<+,2 (*
028\$+<+3+\$=\$5E4#\$\$\$(D+:%:8
§ ;* #*%7#+:1.3 H=&H34," DR,0," (#,%18 8\$ #%,6\$>,%7M,8+\$(* +3 /%E.3
U3O"\$6,1 .E(\$+,4 *".<0,2 .
§ " U3O"\$6D4DR,0,"%2>(7M,8+\$""\$,#,"\$0E#,+* ="+,2%57\$

IXJWF`@IG CKF@WXWPH

K".>3+E%",.28*/14 (D+%.3.34pH, (* +\$ 6&+>:"*=&/".+\$ +*/8"6&/%\$6+3%".+"6&

- P ="+,2%57\$,2 8\$.+3%7M*+\$3 0"\$O,%6E(D+%.3.3pH.
- S1%,4(D+%.3.34pH:0 D:414
- S2\$".>3.7\$?D+%.3.34 ±0,01 pH
- ?D5".+3 #7*.3 0*75(\$+,4: 2 bar .
- S1%,4>*(,6%\$."\$6E4="*,+2%57\$45 °C - +70 °C
- V"\$>D+*8:(\$+:(D8, \$".>3+E%",>*(,6%\$.7\$4NTC 300 Ohm.
- K8+."+&>("3 >*(,6%\$.7\$4 K2+<(\$+3 E %2>("M<(*83
- d\$>,(8<(3.3 : ?D.: (*8,1 1 E 2 .3(*7:8 .
- ?D5".+3 #*"+%*#+E\$/1+3+\$ %,E4.+, \$".>3+E%"; 3m/s
- To \$".>3+E%", 8\$.28,0*1*+\$" \$#< U3O"\$6< 6\$=F0", (E6,24 10m, (* 028\$+<+3+\$
#D6+\$.34\$8&=,5\$ (+*4*#">2(7*4+,2 /"%"".+E
- A%D#*8\$ *78\$"D+,"(, 8\$.280*>*7 (* +,8 U3O"\$6<*56+E (* +,8 #,7, >\$ 578*+\$3
0"\$/*7%".3 +:8 (*+%E.*:8 , 3 0* *56\$+&+\$.3 +,2 8\$ *78\$*16,=3 6\$ 5%E5,%3(*
+*/8,=,57\$ plug'n'play.

- ;28,0*1*+\$" \$#\$< <=\$ +\$ \$#\$%\$7+3+\$6%,*R\$%+E(\$+\$6\$"/3("6& 5"\$ +38 H\$>(.8<(3.E +,2.

"YEVQF`L VI? FG?IX]WF` @IGCKF@WXWPH

- A%<6*"+\$ "5"\$.1.+3(\$ U3O"\$6,1 *=*56+E 5"\$ +38 .2==,5E , \$#"6<8".3 6\$"
- \$#,>E6*2.3 +:8 (*+%E.*:8 , (* +\$ \$6<=,2>\$ +*/8"6&/%\$6+3%".+"6&
- S78\$6\$+&==3=,48\$ 0*/>*7 0*0,(D8\$ \$#\$< D8\$\$.>3+E%",(D+%3.34
 - V"\$>D+*02, \$8\$=,5"6D4R<0,24 0/4-20mA.
 - K6%7H*"\$ 0,1%
 - S#\$8\$=3U"(<+3+\$ ± 0,05%
 - S2\$".>3.7\$: ± 0,05%
 - V"\$>D+*"+D..*%"4*#\$OD4(relays) &8*2 028\$("6,1 , (* 028\$+<+3+\$#%,5%\$(((\$+").(,1 +,24 5"\$/%E.3 :4 alarm.
 - f/*" 028\$+<+3+\$8\$ 0*/>*7 *#"#=D,8 6&%+*45"\$ +38 *#"6,"8:87\$ (* .2.+E(\$+\$ SCADA(D.: #%:+,6<==:8 Modbus, Profibus DP, RS485.=.#.
 - V"\$>D+*#%,.+\$.7\$ 6\$+&IP66
 - S1%,4>*%(.6%\$.7\$4=*"+,2%57\$420⁰C - +60⁰C.
 - I%,O,0,.7\$: 240V AC/60Hz
 -]./14 : 75VA

B. %"7'3,%5 7';,5)'),5 7 . 95.< 7,>7

1. L*#!'% L!% 6- %#6/!-)6%)!- /20%6M#

1.1. %N=JPQIBQNQR P?= ?H=>HQS N

!+ <4D"7#/ + #E!@ 34*/7#&F"A4!#/ (#A"3!EG(!6A (74<!*+&(?#A+7+;/<5A
4;<#!#-!"-46A !+E HA!7/+!#-+E 3+E %# <#!#-<4E#-%4. <#/ %# 4GE3(*4!8-4/ !+A
+/</-&@ J+ AC+#A!7/+!#-!-/+ %# #A!/<#!#-!8-4/ 4G+7+<78*+E+ E3"*?+A, !+ +3+.+
3#*+E-/"L4/ -(&#A!/<@!#!# 3*+F78&#!# <#!" !(A 74/!+E*;.# !+E.

J+ #A!7/+!#-!-/+ !+3+%4!4. !#/3#*"374E*# #3@!+ ED/-!"&4A+ -(A 34*/+?8 !+E ?5*+E
-!"%&4E-(0 .

M <#!#%7/3!/<@#;6;@0 %#4.A#/O.OE&+Q74/!+E*;.# 4A3#*#77876) 2* d315 PN10.
P8<+0 <#!"%7/R(0 !+E #;6;+S .-+ &4 1780 &. !(A #*?/<8 D"-((74/!+E*;.# !6A
<7"O6A !+E O.OE&+;6;+S &3*+4. A# 4.A#/4A3#*#77876 8 -4 34*.3!6-(?#&(75A
?4/&4*/A5A3#*+?5A 4A#77"G(1+1) ;/# 7@;+E0#3+DE;80 &#<*+?*@A/#03#*#&+A80
!6A 7E&!"6A <#/ -EA#<@7+E%(O(/+E*;.#0 -(3!/<5A -EA%(<5A 8 #<@&(<#/ -4
<#!"-!#-(#A";<(0 7@;6 F7"F(0 A#74/!+E*;4. &@A+ACA#0<7"O+0

1.2.)TNFD=JPU DQEJRE?VU =CKWJ>=?XCK?D?RSRUK
=SN ?P?A>E=SN

J+ #A!7/+!#-!-/+ #A#3!S--4!#/ -4 OS+43.34O# 9"!6 #3@!+ CO#D+O/#!"---+A!#/ OS+
E;*+. %"7#&+/"A!7(-(0 +/ +3+.+ /!*+D+O+!+SA!#/ #3@E3@;4/+3*+% "7#&+ O/#A+&80
J# 4/-4*?@&4A#!+A 3*+% "7#&+ 7S&#!# O/C*?+A!##3@!4&#?/-!8 (&#-(!8*#). !+A
E3@;4/+?5*+ #A#3!S--4!#/ 43.-(0 4A/#.+OG(*@0%"7#&+0!+3+%C!(-(0 !6A #A!7/5A
<#/ !+E -E77C<!(!+E <#!#%7/3!/<+S#;6;+S , -!+ O4 /-@;4/+ E3"*?4/ 4A/#.+0?5*+0
3+E !+3+%4!+SA!#/ + T4A/<@Q.A#<#0 U#&(780 J"-(0 <#/ !+ W74<!*+3#*#;6;@
Y4S;+0

!+A ?5*+ !+E E3+;4.+E %#E3"?4/ ?5*+0 ;/# !+3+%C!(-(-!+ &C77+A4G+37/-&+S
-E-!8&#!+0 #A#**@D(-(0 &4 <4A@;/# !(A 4GE3(*C!(-(!6A 3/%#A5A&477+A!/<5A
[#E!#%7(!/<5A 1;<#!#-!"-46A .

!+A G(*@%"7#&+!+3+%4!+SA!#/2 #A!7(!/<" -E;<*+!8&#!# (1 74/!+E*;/<@+ 1 stand
by), !# +3+.# #A#**+D+SA #3@ !+E0 E;*+S0 %#7"&+E0 <#/ <#!#%7.F+EA-!+A
<#!#%7/3!/<@#;6;@ , 4A4*;*+3+/+SA!#/O44A#77"G&C-6 !+E -E-!8&#!+0 #E!+&#!/-&+S.

M/ E;*+. %"7#&+/4.A#/2 +/ +3+.+/ &3*+SA A# 74/!+E*;8-+EA 4.!4 4A+3+/(&CA+;4.!4
#A4G"*(!+/.)4*/--@!4*# 34*/;*#D/<" -!+/?4.#, 4/O/<" ;/# !/0 (74<!*+7+;/<C0
4;<#!#-!"-4/0 O.O+A!#k#!6!C*6 .

M/ 4G6!4*/<C00/#-!"-4/0 <#/ (%C-(!+E #A!7/+!#-.+E 4.A#/O4-&4E!/<C&#/ O.A+A!#/
-!# -?CO/#

2. Y%4%'684!)6!'%)6-!Y*!% 6-2 %#6/!-)6%)!-2

2.1. ?EF[\K =FT ?N=]JFH=?HIFT

!(A &47C!(!6A 1;<#!#-!"-46A 134G4*#;#-.#0]E&"!6A C?+EA 7(D%4. +/
4GE3(*4!+S&4A+/37(%E-&+. #3@ !+ O.<!E+ #<#%"*!6A. W 3#+?8 &4 !(A +3+.#
O/#-!#-/+7+;+SA!#/ +/ 4;<#!#-!"-4/0 @360 3*+<S3!4/ #3@ !(A 3*+A#D4*%4.-#
&47C!(4.A#/
Q?J[BUK = 125]J=/W] = 450,0 m3/h

2.2. Y?E?P=CEJH=JP>H=FJ[QI? RJ? =F ?N=]JFH=>HJF

^.O+A!#/ !# #3*#.#!(!# -!+/?4.# ;/# !+ #A!7/+-!"-/+ #<#%"*!6A, 3+E #D+*+SA !+A
<#!#%7/3!/<@#;6;@ . W-!"%&(#A#**@D(-(0 4.A#/4AO4/<!/<8#/ %#4G#*!(%4.#3@!+A
-?4O/#-&@!6A O/#;6A/L+&CA6A

-)#+?8 #/?&80 (7!/O7) 125
-)#+?8 #/?&80 (&³/5*#) 450
- 9#!5!#!(-!"%&(7E&"!6A
#A#**@D(-(0 (&) -2,28
- !"%&(*"? (0 3C*#!+0
<#!#%7/3!/<+S#;6;+S (&) 14,22
- P8<+0 <#!#%7/3!/<+S#;6;+S (&) 1780

2.3. LQSBQ=EJP^ _`FK >N=]CHCK P?J =E?[_=C=QK
HS]CNaHQSN

2.3.1. !"#\$%&() -.*/ 01\$3454/

J+ 4AO4/<!/<@6&4!*/<@ SR+0"A!7(- (0 ;/# !+A <#!#%7/3!/<@#;6;@ 4.A#/
14,22 & - (-2,28) = 16,50 &
/?Bb>NQ=?J = 16,50 B.

2.3.2 .65"\$!%&(8/ \$%9:;\$4\$!/ 9="=>1 91\$3&*5\$95?*<(9&(9\$9@3&A\$&(*;9="=*;

!+ #A!7/+-"-/+ %# ?*(-/&+3+/(%+SA #A+G4.O6!+/ ?#7EFO+-678A40 &4 4/O/<"
?#7SFO/A#!4&"?/# -E;<+77(!" 8 &4 6!.O40. T/# #A+G4.O6!+E0?#7EFO+-678A40
7#&F"A4!#/#!#?S!(!# 43/D#A4.#0#;6;+S Ra=0,1 ?7-! .

O <#!#%7/3!/<@#;6;@0 %# 4.A#/ <#!#-<4E#-&CA+0 #3@ -678A40 HDPE. T/# !+E0
<#/A+S*/+E0-678A40 #3@ HDPE 7#&F"A4!#/#!#?S!(!# 43/D#A4.#0#;6;+S Ra=0,008
?7-! . T/# #-D"74/# -!+E0 E3+7+;/-&+S0 7#&F"A4!#/# (-S-!#-(3+E O.A4!#/#-!(A
F/F7/+;#D.# ;/# D%#*&CA+E0-678A40 #3@ HDPE, +3@!4 4<!/&!"!#/# !#?S!(!#
43/D#A4.#0#;6;+S Ra=0,04 ?7-! .

2.4.)=FJ[QI? RA? QP]FRUWJ?B\=EFT?RSRaN

2.4.1. B3!=:*/ C9\$9@3&A\$&(*9="=*;

M O.OE&+Q#!#%7/3!/<@#;6;@0 -4 @7+!+E !+ &8<+0%#4.A#/ <#!#-<4E#-&CA+0 &4
-678A40 HD_1 2⁽⁰ ;4AA4"0O/#&C!*+E315 ?7-! <#/#A!+?80_ 10 #!&.

T/# A# 4.A#/("A!7(- (+/<+A+&/<8<#/# ;/# !(A <#78 74/!+E*;.# (#3+DE;8 #3@%4-(0
D4*!5A E75A <.7.3.) (&4;,-!(!#?S!(!# O4A3*C34/ A# E34*F#.A4!/# 2,0 &/O7. <#/(
47"?/-!(A#O/#!(*(%4. 3"A6 #3@0,5 &/O7.

W !#?S!(!# !6A 0,5 &/O7 4.A#/(47"?/-(!#?S!(!# ;/# A# &(A 4&D#A.L4!##3@%4-(
D4*!5A E75A 4 34*.3!6-(@&603+E +/ <S<7+/"A!7(-(0 O4A4.A#/-E?A+. <#/ C?+E&4
&#<+?*@A/#3#*#&+A8 !6A 7E&"!6A 4A!@0+E #;6;+S &4 <.AOEA# 3#*+E-/#-!4.
#3@%4-(D4*!5A, (47"?/-(!#?S!(!# 3*C34/ A# 4<7C;4!#/> 1 &/O7. P4 !(A !#?S!(!#
#E!8 4G#-D#7.L4!#/+ #E!+<#%#*-/&@0+E #;6;+S <#/ (3#*" -E*-(!6A 43/<#%.-46A
-4 <"%4<S<7+"A!7(-(0 .

P4 F"-(!(A #A#&4A@&4A&C;/-(3#*+?8 (Qmax = 450,0 m3/h) <#/ !+A !*@3+
<#A+A/<874/!+E*.;#0 4A3#*#77876 , 3*+<S3!4/ !#?S!(!# *+80 Umax=1,03 &/O7.

4 !47/<8D"-(%74/!+E*.;+SA+/ #;6;+. -EA4?50 4A3#*#77876 .

2.4.2. E="=? ? !1\$)/ \$*< 91\$3&*5\$95?*<

M/ #;6;+. 4A!@0!+E #A!7/+!#-.+E %# 4.A#/ <#!#-<4E#-&CA+/ #3@ #A+G4.O6!+
?#7EFO+-678A#-4/*"0 O/#-!"-46A Sch10S.

T/# 3#*@&+/-E0&4!+E0#A6!C*6 7@;+E0(&4;.-!(!#?S!(!# O4A3*C34/ A# E34*F#.A4/
!# 2,0-2,5 &/O7. <#/ (47"?/-(A# O/#!(*(%4. 3"A6 #3@0,5 &/O7.

3. *#c*!'6!'! 2 -/-L!)0-! %#6/!-)6%)!-2

3.1. %EJAB^K?N=]JaN

!+A G(*@%"7#&+!+E #A!7/+!"-/+E !+3+%4!+SA!#/OS+#A!7.40;/# !(A 5%(-(!6A
7E&"!6A #3@!+E0 E;*+S0 %#7"&+E0!+A <#!#%7/3!/<@#;6;@ , #3@! /0 +3+.40 (&.#
4.A#/74/!+E*;/<8 <#/("77(4D4O*/<8(stand – by).

3.2. 0?NFBQ=EJP^_`FK =Q]JP UKV>HCK BQ]QJ=FTERI?W_F
P]>WSN P?= ?A]JD=JPF_

4 +*.L+A!# !47/<80D"-(0 , +3@!4%#74/!+E*;4. + 3#*"77(7+0 O.OE&+@;6;@0 HDPE
d315 PN10, %#3*C34/ +/ 3*+-D4*@&4A40-!(A 3#*+S-# #A!7.40+O(+S&4A40&C-6
E%&/-!8 -!+D5A (inverter) A#&3*+SA A# 43/!S?+EA3#*+?8 450 m³/h E3@

· T46&4!*/<@SR+0"A!7(- (0	=	16,5 &
· H3574/40 *+80	=	6,0 &
· SA+7+ &#A+&4!*/<+S&4-!+;;E7+3+.(()	=	22,5 &

M/ #A!7.40%#4.A#//<#AC0A# 74/!+E*;8-+EA <#!#%7.F+A!#0-4 CA#A&@A+A7"O+ !+E
<#!#%7/3!/<+S#;6;+S , 43/!E;?"A+A!#0 -(&4.+ 74/!+E*;.#0 4A!@0+E 43/!43!+S 34O.+E
74/!+E*;.#0 !+E0.

13/-(&#.A4!#/ @!/ + *E%&/-!80 -!*+D5A (inverter) %# 34*/7#&F"A4!#/ -!+A
3*+-D4*@&4A+-!(A 3#*+S-# 4G+37/-&@

^/4E<*/A.L4!#/@!/!# #A6!C*6 &4;C%(4.A#/4AO4/<!/<"<#/+ O/#;6A/L@&4A-0*C34/ A#
E3+F"7+EA !+E0 O/<+S0!+E0 E3+7+;/-&+S0 7#&F"A+A!#0 E3@R(!(A 3*+!4/A@&4A(
O/#&@*D6-(<#/!+A 3*+-D4*@&4A+4G+37/-&@

3.3. %N>WQTHŦREaNA?]>BSN

4 <"%4 E;*@ %"7#&+ %# !+3+%4!(%+SA2 E3+F*S?/+/#A#O4E!8*40 (mixer). J+74/!+E*;/<@-?8&# %#4.A#;/# <"%4E;*@ %"7#&+1 74/!+E*;/<@0+ 1 4D4O*/<@0<+3@0 ! (0 74/!+E*;/#0 !+E0 4.A#/(#A"O4E-(!+E 34*/4?+&CA+Ŧ+E D*4#!.+E, C!-/ 5-!4 &4!" !(A 3#S-(!6A #A!7/5A A# 3#*#&4.A4/ 7.;+ 8 <#%@7+ŦL(&#. a!-/ 4&3+O.L4!#/(<#!#<"%/- (7"-3(0 -!+ D*4"!/+ . 13/3*@-%4!# &4 !(A ?*8-(!6A #A#O4E!8*6A O/#-3"!#/ (43/37C+E-# <+S-!# (+3+.# O(&+E*;4. 3*+F78&#!# -!# #/-%(!8*/# -!"%&(0 (376!(*+O/#<@3!40). 13.-(0 3#*C?4!#/ +GE;@A+(A &"L# !6A 7E&"!6A, C!-/ 5-!4 A# &4!#!.%4!#/?*+A/<" (CA#*G!(0 #A#4*@F/#0#3+-SA%4-(0 !6A +*#A/<5A <#/(-EA43#<@7+E%3#*#;6;8 EO*+%4.+EW 74/!+E*#;# !6A #A#O4E!8*6A %#47C;?4!#/#3@!+ -S-!(&# #E!+&#!/-&+S.

T.A+A!#/O4<!C&#/ 4A#77#<!/<C&C%+O#A"O4E-(0 @360F#7F.O#bypass -(A #A!7.# 8 #A#O4E!8*#0#4*/-!8*#0 !S3+E flow jet. !(A !474E!#.# 34*.3!6-(#*<4. (4;<#!"-!#-(4A@flow jet -4 <"%4E;*@ %"7#&+

3.4. 0?HC=UE?K (6QB?[JH=UK

J# 4/-4*?@&4A#7S&#!# -!+A 3*+%"7#&+ !+E #A!7/+!#-.+E %# O/C*?+A!#/#3@ (74<!*+<.A(!+ &#-(!8*# #A+/?!+S <#A#7/+S 5-!4 A# &(A 3#*.-!#!#/#A";<(4-?#*/-&+S !+E0. M 4-?#*/-&@0 !6A 7E&"!6A -4 #A!7/+!#-/+ 3+E F*.-<4!#/-4 !@-+ <4A!*/<@(&4.+ !(0 3@7(0!6A [C6A P+EO#A/5A%#O(&+E*#;+S-4 CA!+A#3*+F78&#!# +-&5A.

4 474S%4*(4<+8 ((-!"%&(E;*5A <"!6 #3@ !+A &#-(!8*#) !+ #3#/#!+S&4A+ O/#%C-/&#&A+&4!*/<@R+0#A"A!(4.A#/(0 !"G(0 !6A 75 cm.

3.5.)_H=CB? QX?QEJHBF_ ?D^HBCHCK

3.5.1. !1&(G 5\$*&! ?9

)*+F7C34!#/ (4;<#!"-!#-(-E-!8&#!+0 4A4*;(!/<+S 4G#4*/-&+S !+E ?5*+E !6A E;*5A %#7"&6A (-EA4?50). J+ -S-!(&# %# 34*/7#&F"A4/ #A4&/-!8*# <#/ #;6;+S0 3*+-#;6;80 (#3@ !+ 34*/F"77+A) <#/ #3#;6;80 #C*#, +/ +3+.+/ %# !+A +O(+SA -4 F/@D/7!*+)*+F7C34!#/ 43.-(0 (4;<#!"-!#-(-E-!8&#!+0 4A4*;(!/<+S 4G#4*/-&+S !+E ?5*+E !+E G(*+S %#7"&+E O(7#08 @7+E!+E E3+;4.+E ;/# !(A #3+DE;8 -E;<CA!*6-(0 43/<.AOEA6#4*.6A #77" <#/ !(A #3#;6;8 !6A #3674/5A %4*&@!(!#0!6A </A(!8*6A !6A #A!7/5A J+ -S-!(&# %#34*/7#&F"A4/ #A4&/-!8*# <#/ #;6;+S0 #3#;6;80 #C*#, +/ +3+.+/ %# !+A +O(+SA -(A #!&-D#/*#. W 74/!+E*;.# !+E -E-!8&#!+0 4G#4*/-&+S 43/F"774/ E3+3.4-(-!+A ?5*+ !+E E3+;4.+E, &4 #3+!C74-&# !(A #3+DE;8 #A4GC74;<!(00/#**+80 +-&5A -!+A /-@;4/+ ?5*+ . b# 47C;?4!#/%4*&+!#!/<" <#/ ?4/*+<.A(!#.

3.5.2. H*1GJ9 9A9="=K/ 98%9<=%*; @93G#*<

T/# !(&+A"O##3#;6;80 #C*# 4G#4*/-&+S!+E E;*+S %#7"&+E43/7C;+A!#!+E7"?/-!+A 30 4A#77#;C05*# &447"?/-!(3#*+?8 #3#;6;80 1000 &³/5*# .

13/7C;4!#/ F/@D/7!*+ #A!.-!+/?(0 OEA#&/<@!(!#0&4 47"?/-!+ !# 1000 &³/5*# . J+ F/@D/7!*+(O40<#/ 3#*#<"!6) %#!*+D+O+!4. !#/ &4#A4&/-!8*# #A!.-!+/?(0 3#*+?80 <#/ O/#!/%C&4A-8#A+&4!*/<+S

1A!@0!+E #A!7/+!#-.+E , !+ -S-!(&# 3*+-#;6;80 #C*# #3@ !+ 34*/F"77+A <#/ #3#;6;80 3*+0 !+ F/@D/7!*+ %# #3+!474. !#/ #3@ #;6;+S0 <E<7/<80O/#!+&80 #3@ HDPE PN6, 47"?/-!(0 O/#&C!*+Ed250 &4 <+77(!C0-EAOC-4/0 H3@!+ 4/O/<@4&"?/+ O/#34*"-&#!+0 -!+ 4G6!4*/<@!+/?4.+ !+E E3+;4.+E %# G4</A"#;6;@0 47"?/-!(0 O/#&C!*+Ed250 HDPE/PN 10, + +3+.+0 +O4S+A!#04A!@0+E 4O"D+E0 %#<#!#78;4/ -!(A #A#**@D(- !+E #A4&/-!8*# !+E F/@D/7!*+E c7+/ +/ #;6;+. #A"A!(!+E #A4&/-!8*# %#C?+EA47"?/-!(<7.-(1% 3*+0 !+E0 E;*+S0 %#7"&+E0<#/ <#"A!(!+E

#A4&/-!8

