

S' · Hydronic system



I] Z > F (\$ j c h V g] n Y g j a X h i V t l c h b Z V c i i d' g Y j X Z i j Z h z i # e i b Z d [i] Z X d c Y t l c c e \ V c Y' X d d a e \ Y Z k X Z h #] Z n X V c V Z' a c' Z Y i d V c n' t e Y' d [l V i Z g X d d a z g \$

I] Z > F j c t] V r O

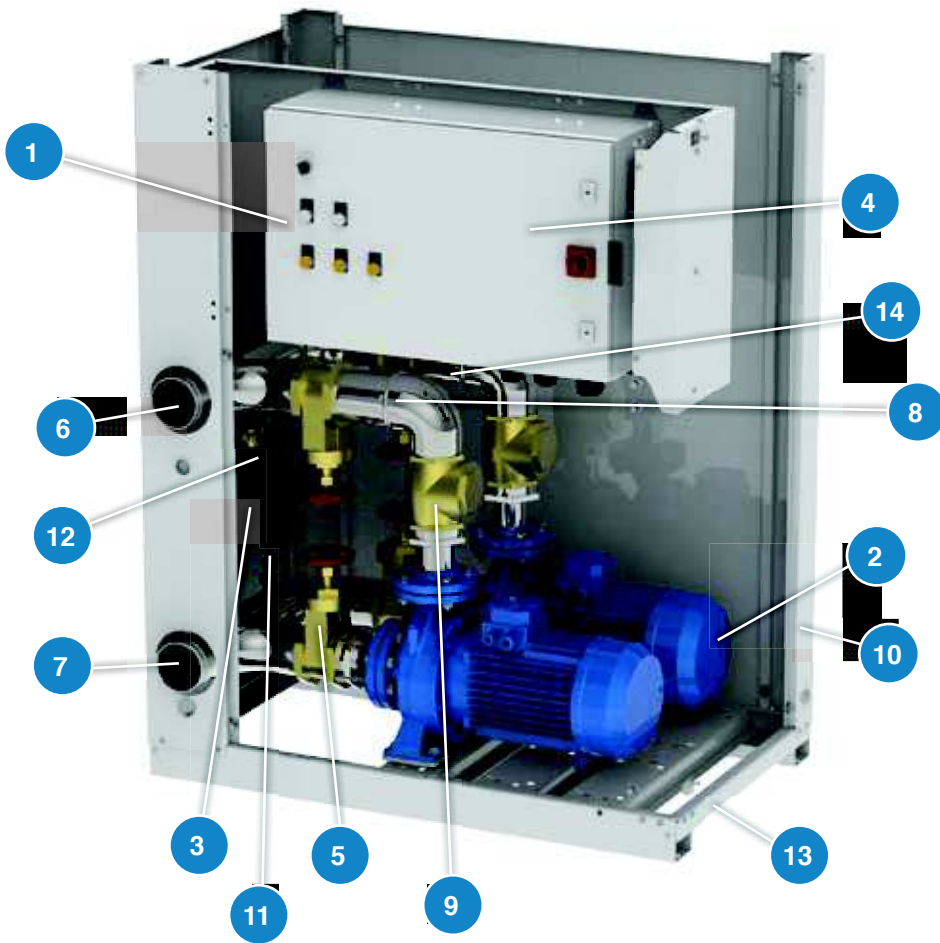
- e e t e \ t h j a i Z Y i t] V c i # X d c Y Z c h M Z Z a h i d b Z g z
- i t e \ a z d g y d j V Z X Z c i g j \ V a e j b e l t] h j i # d k V a z
- F d l Z g h t X j V a M y ' l t] Y Z k X Z i d V a Z g c V Z' e j b e h l t] Z k Z g n h i V g # e k Z g h t c l t] i l d' e j b e h z' h i V g # e' d [i] Z' V W X # e' e j b e' t' X M Z d [V g V Y d l c k Z g h t c l t] i l d' e j b e h z' b V c Z i d i] Z g p V a e g l i Z X i t l c' X d c i V X i h' i d' X d b b V c Y i] Z' e j b e h [g l b ' V Y h i V c X Z' e g l i Z X i t l c X M Z \ d g n' F ++ \$
- ; n a V c h t l c k Z h Z a l d e i t l c V a z
- i V j i n k V a z
- : Z V Z g i d g
- C V c d b Z i Z g
- < a i j e % X t X j V g Z k V a z
- 8 M h z' t e \ V a k V c t e Z Y V c Y X d M Z Y h i Z Z a h j Z Z i h
- i Z a # h j e e d g t e \ V a j b t e j b' e V c Z a n [d g d j i - Y d d g t e h i V a M t l c
- F V c Z a n i] V i' X V c' V Z' f j' X' a n' V c Y' Z V h a n' g' - b d k Z Y
- ; V m V c Y f j' X' V X X Z h i d i] Z' H t X j V a M y'

F e t e \ t h j a i Z Y i t] V c i # X d c Y Z c h M Z Z a h i d b Z g z



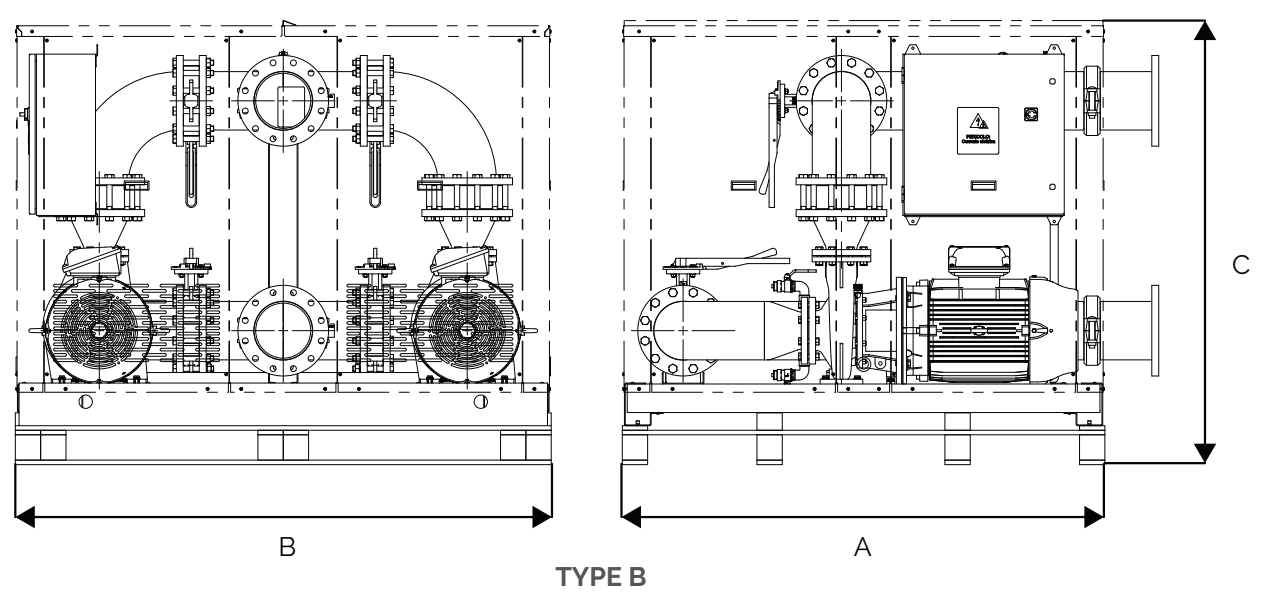
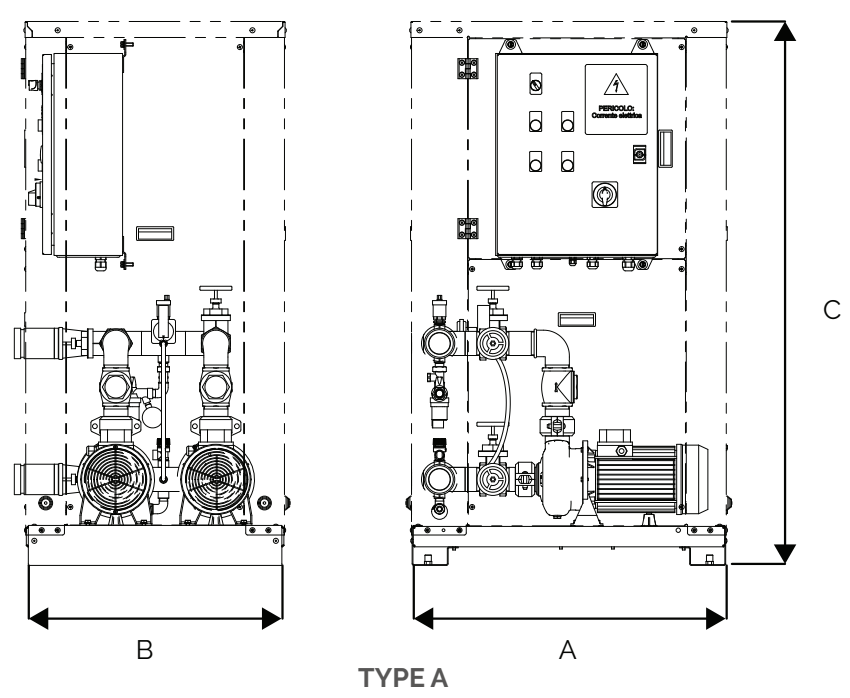
I] Z V g j W g c \ Z d [X d b W e M t l c h i d Z g n V h d j - i t l c [d g Z k Z g n h e \ a z i n e Z d [t e h i V a M t l c \$

Component parts



| components | |
|------------|-------------------------|
| 1 | Control panel |
| 2 | Emergency stop button |
| 3 | Water inlet |
| 4 | Water outlet |
| 5 | Water filter |
| 6 | Water inlet valve |
| 7 | Water outlet valve |
| 8 | Water inlet filter |
| 9 | Water outlet filter |
| 10 | Water inlet connection |
| 11 | Water outlet connection |
| 12 | Water inlet connection |
| 13 | Water outlet connection |
| 14 | Water inlet connection |

dimensiones



Single pump

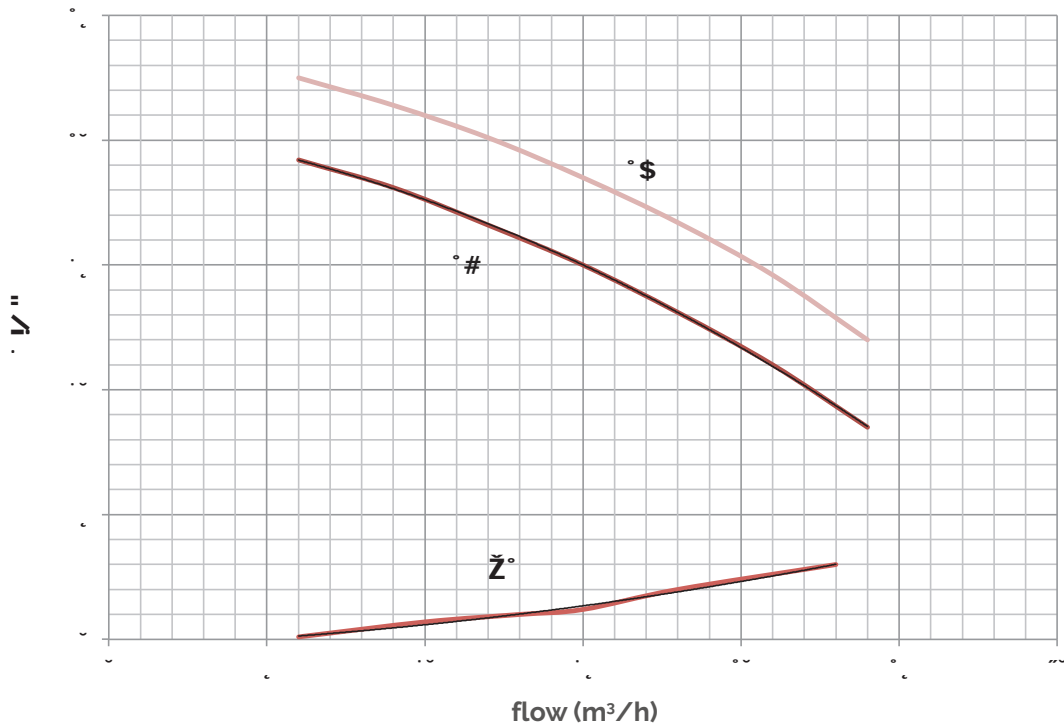
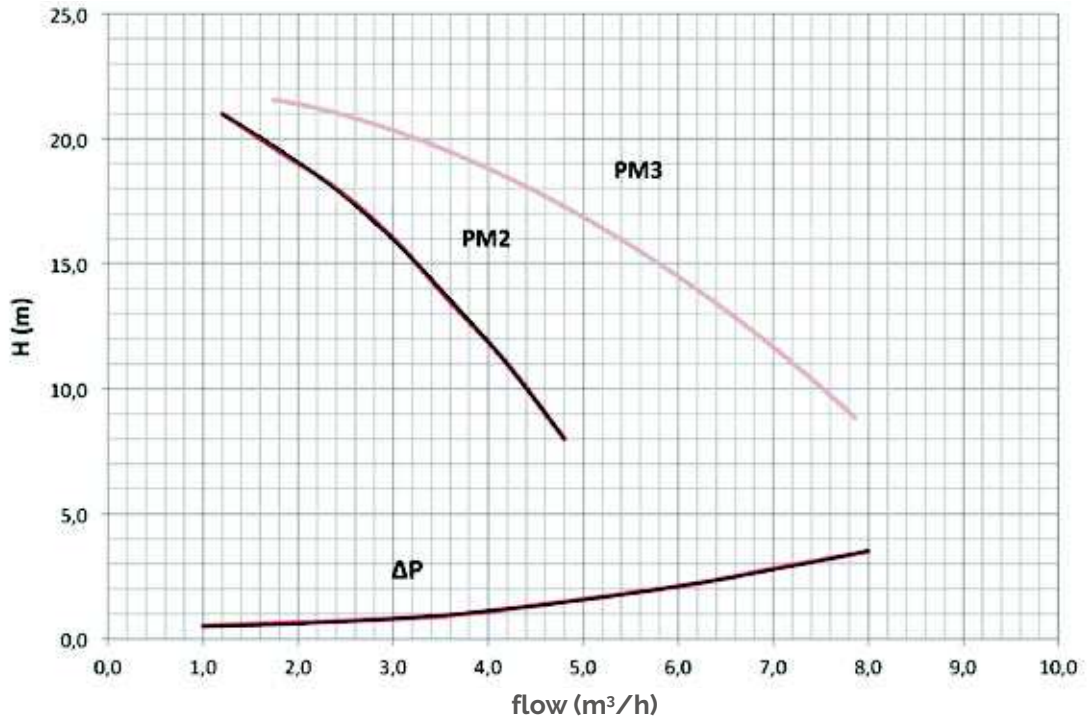
| | pump model | dimensions | | | type |
|------|--|------------|------|------|------|
| | | A mm | B mm | C mm | |
| höz' | FC(DFC)DF'DF(D) P3N P4N P5N | 650 | 790 | 1360 | A |
| höz' | F, DF-DF, DF/DF' & D' P11N P12N P13N P14N F'+DF', DF'-DF'. D | 1116 | 790 | 1360 | A |
| höz* | P19N P20N P21N | 2000 | 1500 | 1500 | B |

Double pump

| | pump model | dimensions | | | type |
|------|---------------------------------------|------------|------|------|------|
| | | A mm | B mm | C mm | |
| höz' | FC(HFC)HF'HF(H) P3R P4R P5R | 650 | 790 | 1360 | A |
| höz' | F, HF-HF, HF/HF' & HF''H' | 1116 | 790 | 1360 | A |
| höz) | P12R P13R P14R P15R F', HF'-HF'. H | 1116 | 760 | 1600 | A |
| höz, | P19R P20R P21R | 2000 | 1500 | 1500 | B |

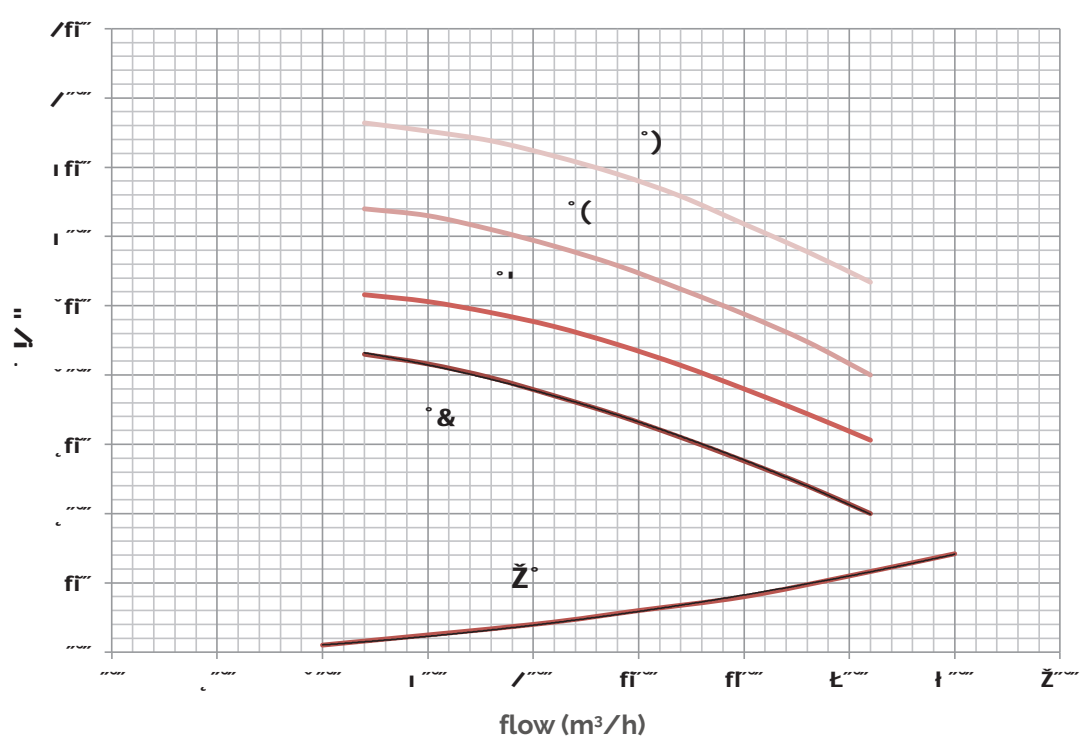
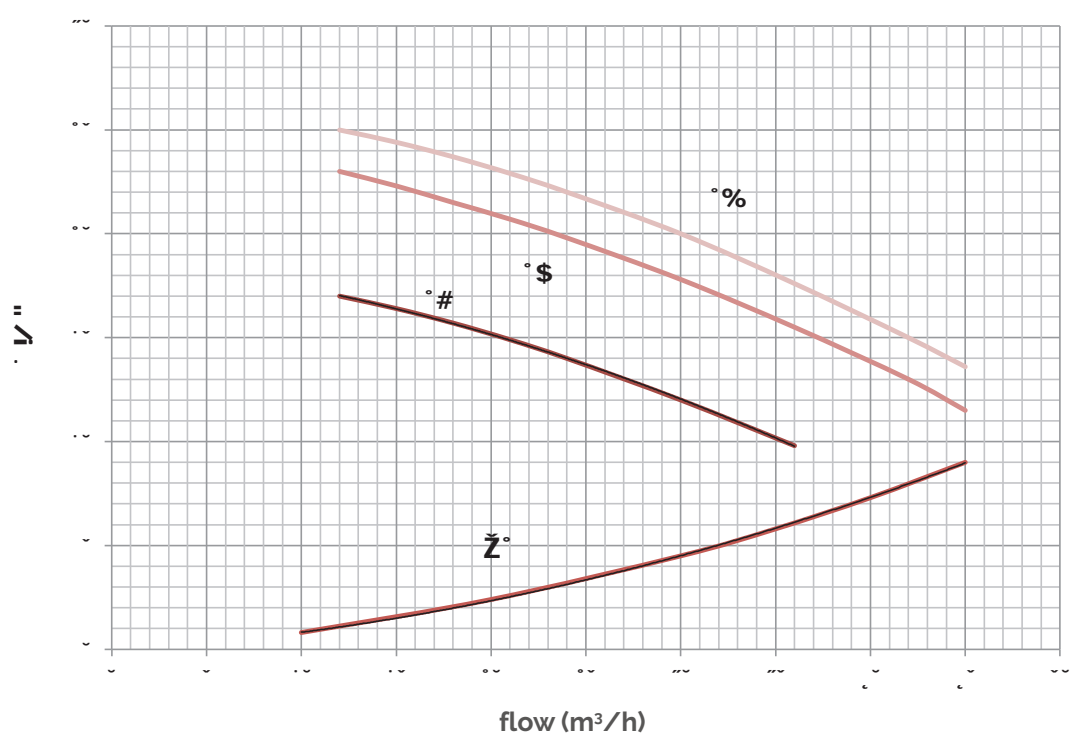
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Prevalence and pressure loss curve



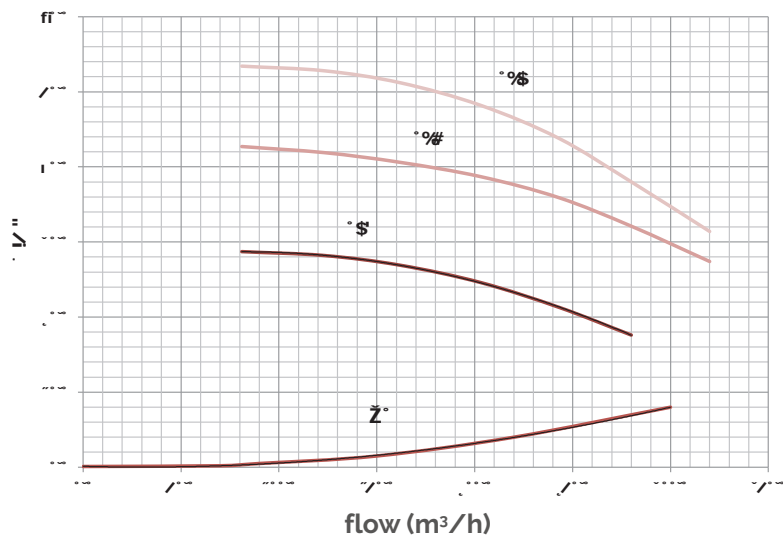
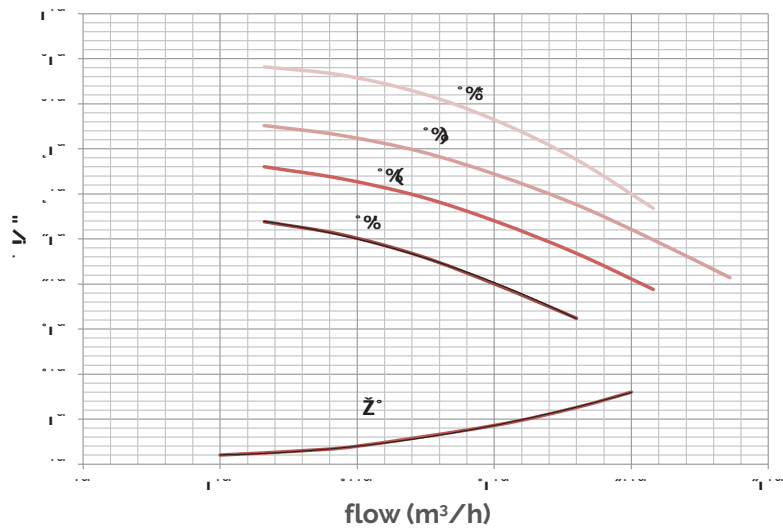
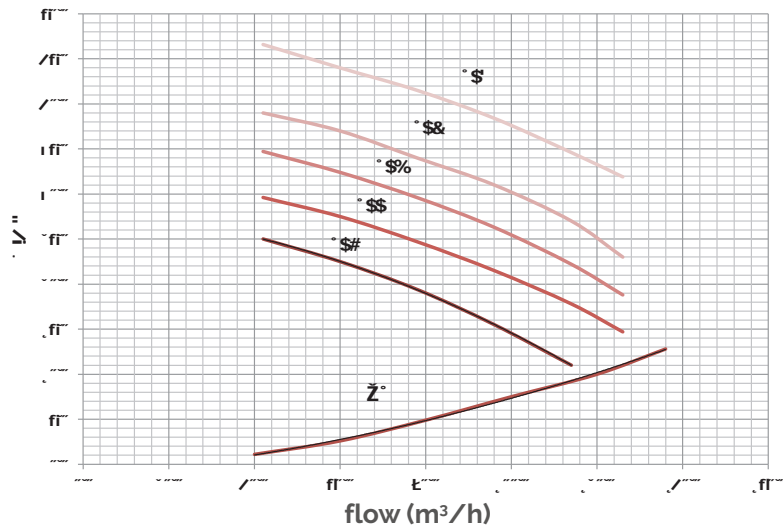
Pressure drop HP unit

Prevalence and pressure loss curve



Pressure drop HP unit

Prevalence and pressure loss curve



Pressure drop HP unit

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technical information

| pump model | connections inch | Wsb1 kg | Wsb2 kg | F.L.I kW | F.L.A. (400/3/50) A | F.L.A. (230/1/50) A | Ve l | single pump | | double pump | |
|------------|------------------|---------|---------|----------|---------------------|---------------------|------|-------------|-------|-------------|-------|
| | | | | | | | | code | price | code | price |
| PM2 | 1" | | | 0.5 | 10 | 10 | 12 | PM2 | | PM2 | |
| PM3 | 1" | | | 0.5 | 10 | 10 | 12 | PM3 | | PM3 | |
| P1 | 1" | 90 | 119 | 0.5 | 10 | 10 | 12 | P1 | | P1 | |
| P2 | 1" | 90 | 119 | 0.5 | 10 | 10 | 12 | P2 | | P2 | |
| P3 | 1" | 91 | 121 | 0.5 | 10 | 10 | 12 | P3 | | P3 | |
| P4 | 1" | 93 | 125 | 0.5 | 10 | 10 | 12 | P4 | | P4 | |
| P5 | 1" | 96 | 131 | 0.5 | 10 | 10 | 12 | P5 | | P5 | |
| P6 | 1.5" | 153 | 220 | 0.5 | 10 | 10 | 25 | P6 | | P6 | |
| P7 | 1.5" | | | 0.5 | 10 | 10 | 25 | P7 | | P7 | |
| P8 | 1.5" | 275 | | 0.5 | 10 | 10 | 25 | P8 | | P8 | |
| P9 | 1.5" | | | 0.5 | 10 | 10 | 25 | P9 | | P9 | |
| P10 | 1.5" | 296 | | 0.5 | 10 | 10 | 25 | P10 | | P10 | |
| P11 | 1.5" | 190 | 304 | 0.5 | 10 | 10 | 25 | P11 | | P11 | |
| P12 | 1.5" | | | 0.5 | 10 | 10 | 25 | P12 | | P12 | |
| P13 | 2" | 224 | | 0.5 | 10 | 10 | 25 | P13 | | P13 | |
| P14 | 2" | 447 | | 0.5 | 10 | 10 | 25 | P14 | | P14 | |
| P15 | 2" | | | 0.5 | 10 | 10 | 25 | P15 | | P15 | |
| P16 | 2" | | | 0.5 | 10 | 10 | 25 | P16 | | P16 | |
| P17 | 2" | 270 | 504 | 0.5 | 10 | 10 | 25 | P17 | | P17 | |
| P18 | 2" | 532 | | 0.5 | 10 | 10 | 25 | P18 | | P18 | |
| P19 | 2" | | | 0.5 | 10 | 10 | 50 | P19 | | P19 | |
| P20 | 2" | | | 0.5 | 10 | 10 | 50 | P20 | | P20 | |
| P21 | 2" | | | 0.5 | 10 | 10 | 50 | P21 | | P21 | |

Pve (bar) 1,5 Ps (ba) 3 T min (°C) -10

Legend

L HWL Z^]i>FI 1 4] ' ej b eizb einž
 L HWL Z^]i>FI 1 4] (ej b ehiZb einž
 C VmWdZ/Y edl Zg
 C VmWdZ/Y Xj gZci
 KZ XVeXfnd[ZneVchdc kZHhZa
 FkZ FgZdW d[ZneVchdc kZHhZa
 FhC VndeZg d[egZHj g
 I b C C iZb eZgAj g d[i] Z af j Y

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user conditions

Normal user conditions

I] Z ' j c f ' h ' Y Z h \ c Z Y ' i d ' V Z ' X d c c Z X i Z Y ' I ' f ' X d c Y ^ i t c t e \ Y Z k \ Z h V c Y X d j e a Z Y ' i d ' V X ' a i z g j] X ' i V Z h i] Z] Z M [g l b i] Z Y Z k \ X Z i] V c ' h i d V c ' e X g V h Z ' e i] Z ' i] Z g p V a c d b e V a h i V c V V g ' f - # (1 9 Z i] Z V k Z g \ Z ' d e Z g V i t e \ i Z b e Z g i j g ' h ' V e e g l m b V i Z a n ' & f 9 V c Y i] Z ' d e - Z g i t e \ e g h j g ' k V o Z h V i i l Z Z c & \$ V c Y (\$ V W g l] Z ' d l Y Z e Z c Y h d c i] Z ' d k Z g f a i j c X i t c t e \ d [i] Z ' c h i V a a i t c t e \ i] Z ' X d d a t e \ j c f ' e Y X M i Z Y V M i] Z ' c i Z g h Z i t c V i i l Z Z c i] Z ' X ' V g X i Z g h i X X j g Z ' d [i] Z ' e j b e ' V c Y i] Z X ' V g X i Z g h i X X j g Z ' d [i] Z ' c h i V a i t c t e \$] Z > F (\$ \ g j e ' h ' Y Z h \ c Z Y ' i d ' j c X i t c t e V h V] Z M ' e j b e ' V j i ' f ' X V c V a n d j c X i t c t e g a i k Z a n] ^] i Z b e Z g i j g ' h i ' f ' V b V r n b j b d [+ & f 9 V c Y i ' f ' V b V r n e g h j g ' d () V W \$ f i] Z > F (\$ ' h ' d e Z g i k Z ' e V c Z c k g l c b Z c i l ' f ' a i l ' l ' c i Z g i Z b e Z g i j g ' h ' f ' h g X d b b Z c Y Z Y ' i d ' j h Z ' V c - i # [g Z o Z ' \ Z a d j g h h i V c X Z \$ 7 a Z g V i k Z a n ' l Z ' g X d b - b Z c Y i] Z ' Z b e i n t e \ d [i] Z ' n Y g j a X X g j ' f ' e d g Z g i d e g k Z c i i] Z l V i Z g [g l b V Z e \ [g k o Z c \$

Protective devices

I] Z ' > F (\$ ' h ' e g l i Z X i Z Y ' [g l b ' e d h V a Z ' j c X i t c t e \ Z g g l g h d g e X M j i t j h b V c d Z j k g h i] V c ' h i d i] Z ' c h i V a a i t c t e d [i l d Y Z k \ X Z h o] Z Y ^ Z g ' c i V a e g h j g ' h i X ' i d e i t c V a Z V c Y i] Z H M [Z i n k V a Z \$ 7 e d h V a Z ' e g l V a Z b ' h ' V V g V Y d l c ' d [i] Z ' X Z c i g j \ V a e j b e ' l] X ' X V j h Z h i] Z k Z X i d j j ' Y i d ' h i d e V c Y Z k Z c i j V a n i d [g Z o Z \$] Z ' j h Z ' d [V Y ^ Z g ' c i V a e g h j g ' h i X ' i j e e a Z Y ' d c Y Z - b V c Y Z ' l] X ' V a i X h i] Z ' X d b e g h h d g ' e g k Z c i h i] h ' e X d c k Z c Z c i ' h j V i t c t e \$] Z ' h i V c V V g ' > F (\$ ' h ' j e - e a Z Y ' i ' f ' V c Z n a V c h t c k Z h Z a V c Y H M [Z i n k V a Z \$ 7 X V h Z ' d [V l g l c \ b V c d Z j k g ' d g d i] Z g Z k Z c i h l] X ' X V j h Z d k Z g e g h j g ' i] Z H M [Z i n k V a Z ' X V a V g i Z Y V i) V W g ' h V j i d b V i X V a n V X i k V i Z Y \$] Z Z n a V c h t c k Z h Z a V e e g l e g M Z a n e g a l W Z Y ' ' c i Z g k Z c Z h l] Z c i] Z g ' h V c Z n Z h h k Z Y a i t c t e d [i] Z ' j ' Y h ' e i] Z ' c h i V a i t c t e \$

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of the circuit and the expansion vessel

Max water content in the device and dimensions of the expansion vessel

E c X] Vg' i] Z' b Vm] VZgkdj b Z' c i] Z' nYgj aX' chVam' dc' h' cY' XMYZ' Xdb eV' VZ' l' f] i] Z' XVeVX' n' d' i] Z' ZneVchdc kZH ZaVcY VeeXWZ id Va> F' (\$' b dYZ' a' f] Z' h' [ZinkVakZ Vard] VhVhVg' j' e kVj Z' f] Vg' [dg Vab dYZ' a' f] i] Z' Z' ZX' kZ' l' VZgXdc iZci' c' i] Z' YZk' XZ' "Vh' l' ZaVh' c' i] Z' h' dg' A' Z' iVc' "Zn' ZZYhi] Z' deZg' i' c' \ XdcY' f' ch' c' i] Z' X] Vg' "Vcd] Z' g' h' Z' XdcY' ZneVchdc kZH ZaVcY' dj' a' VZ' chVaz' Yid' iV' Z' i] Z' WYZYI' VZgkdj b Z\$

IVk\$

| Pump model | Hydraulic height | m | 15 | 10 |
|---------------------------|--|-----|---------|-------|
| | Preload of the expansion vessel | bar | 1,80 | 1,50 |
| PM2 PM3 P1 P2 P3 P4 P5 | 9' g' j' f' h' b' Vm] VZgXdc iZci' f' Z' | a | 492 | 615 |
| | 9' g' j' f' h' b' Vm] VZgXdc iZci' f(Z' | a | 315 | 394 |
| P6 - P18 | 9' g' j' f' h' b' Vm] VZgXdc iZci' f' Z' | a | / . * | 1230 |
| | 9' g' j' f' h' b' Vm] VZgXdc iZci' f(Z' | a | 630 | - . . |
| P19 - P21 | 9' g' j' f' h' b' Vm] VZgXdc iZci' f' Z' | a | ' / , . | 2460 |
| | 9' g' j' f' h' b' Vm] VZgXdc iZci' f(Z' | a | 1260 | 1576 |

Note: the expansion vessel is optional and should be ordered separately.

EeZg' i' kZ' XdcY' f' ch' c' i]

- f' Z' Xddat' \
- C' c' i' Z' b' e' d' [j' Y' 3' *' f' 9
- C' Vm] i' Z' b' e' d' [j' Y' 3' *' & f' 9
- f(Z'] ZV' c' \ f] ZV' e' j' b' e' Z'
- C' c' i' Z' b' e' d' [j' Y' 3' *' f' 9
- C' Vm] i' Z' b' e' d' [j' Y' 3' *' & f' 9

IVk\$

| Water/ glycol mix. | Water temperature | | Correction factors | Reference value |
|--------------------|-------------------|--------|--------------------|-----------------|
| | max °C | min °C | | |
| 10% | 40 | -2 | &&&- | f' Z' |
| 10% | 5 | -2 | && . , | f(Z' |
| 20% | 40 | -4 | &&) * | f' Z' |
| 20% | 50 | -4 | && & * | f(Z' |
| 30% | 40 | -6 | && /) | f' Z' |
| 30% | 50 | -6 | && + + | f(Z' |

Hydronic systems

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I] Z ZneVchtlc kZHhZã d[Vaib dYZãr' hiegãlWZY1 ¶] VhVcVYg kvã Z d['\$ Wg\$
 I] Z kvã Z] Vhid VZ WVeizY i] dj \ id i] Z] Z^ i] > d[i] Z YZk^Z\$

I] Z [dç j ã/j hZY id XVAj ã/Z i] Z egãlW kvã Z d[i] Z ZneVchtlc kZHhZã d
 F '3t> %&\$Z&\$

BZ\ZcY

>Q Z^ i] d[i] Z YZk^Z 'c b ZiZg

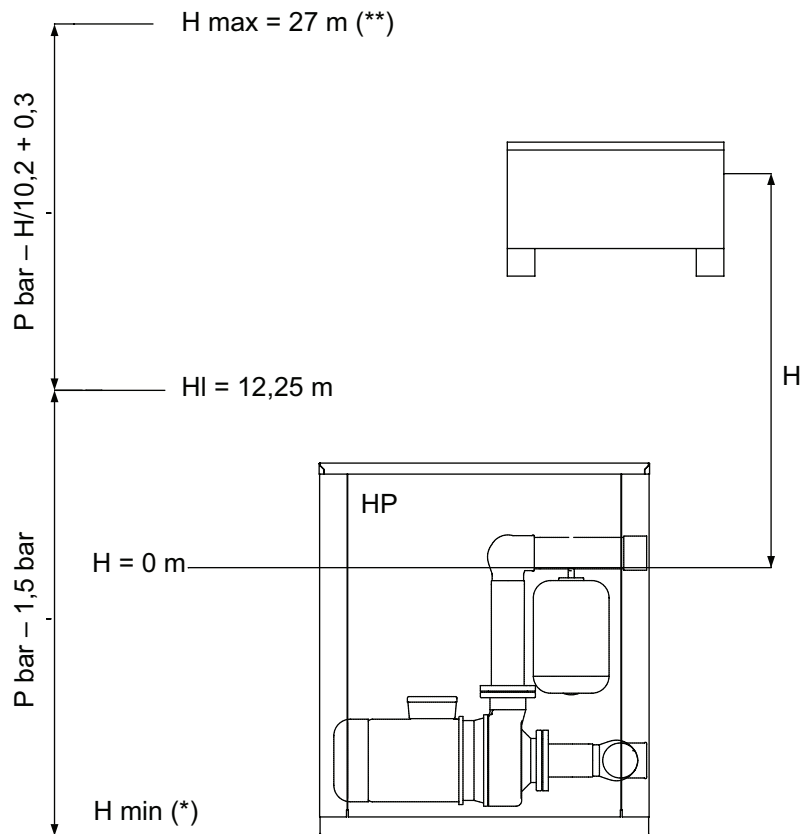
F egãlW d[i] Z ZneVchtlc kZHhZã Wg

i] dj ã' i] Z egãlW kvã Z VZ ãrhi] Vc i] Z hVcVYg kvã Z "cd' ãiZgZci tlc] Vhid VZ XVGZ Y dj i\$] h b ZVch
 i] V' Vc' ãiVãM tlc l ¶] V] Z^ i] d[ãrhi] Vc " (\$ + b ZiZg] VhV egãlW d['\$ Wg\$ c i] h XhZ i] Z deZgãdg
 h] dj ã' dcanX] ZX i] Z egãlW g kvã Z VcY cdi' ãiZgZcZ\$

; nmb eã

L ZiV Z V] Z^ i] > d['\$ \$] Z egãlW kvã Z hO

F '3t' +) %&' (Z&) '3' ". Wg



>Q Z^ i] d[i] Z YZk^Z

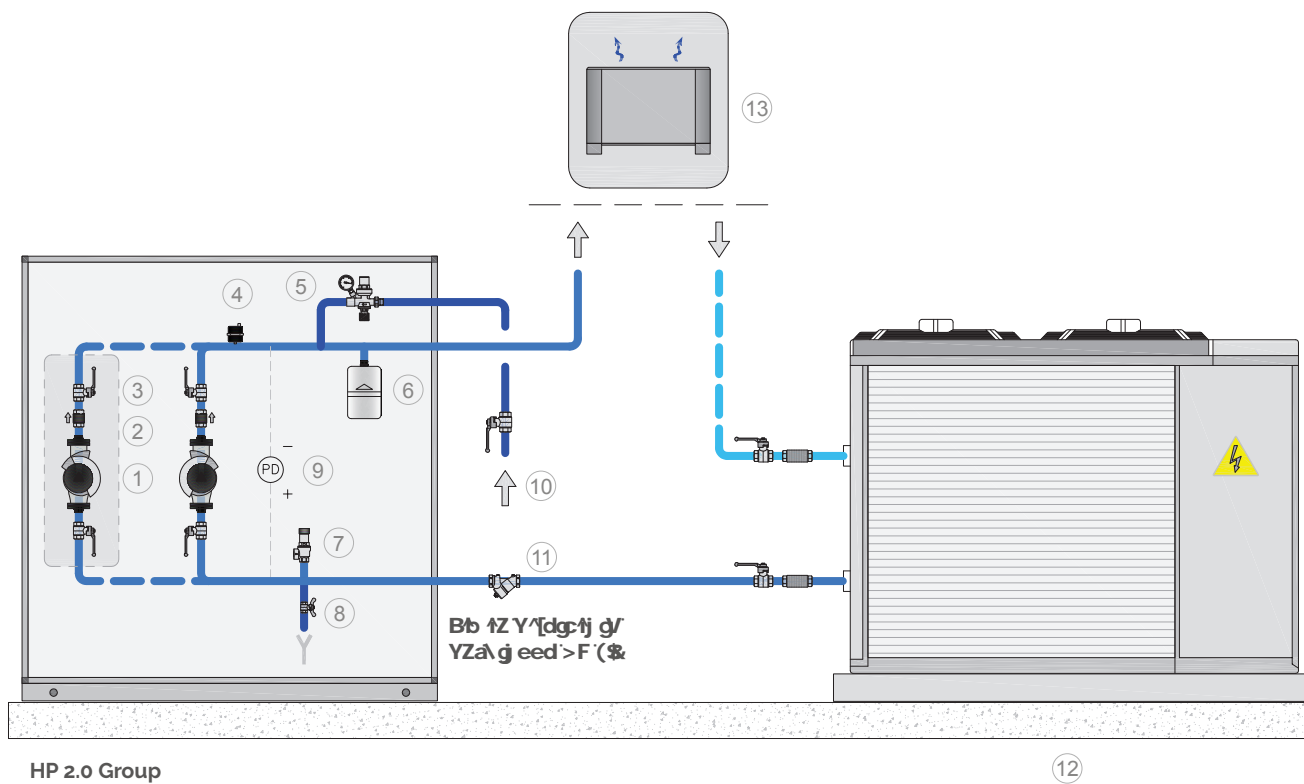
>b Vn b Vn] Z^ i] d[i] Z YZk^Z

>' Q Z^ i] l] Zc i] Z egãlW d[i] Z ZneVchtlc kZHhZã h i] Z h b Z Vhi] Z hVcVYg kvã Z

žkZgñi] V i] Z ãl Zhi edci d[i] Z YZk^Z Xvc hj eedj i] Z egãlW g

žkZgñi] V i] Z] ^] Zhi edci d[i] Z YZk^Z YdZhicdi ZnZZY i] Z b Vn] Z^ i] > b Vn - b \$

S' · · ô é ÿ ñ hydraulic chart



Legend

- '\$ 99j áídg
- (\$ í j i#d kV&kZ ídcankZghélc í j) ('ej b ehž
-)\$ dc#d kV&kZ
- *\$ YZVZđídg
- +\$ Vj idb V'X' átc\ j c↑
- , \$ ZnaVchélc kZhhZáidei élcVáž
- \$ H[ZinkV&kZ
- . \$ dj íži
- /\$ Y^ Zg'ci V&eg'hhj g' H íX] ídei élcVáž
- '&\$ tázi g'ij g'c\ j Y
- '' \$ N' áZg'E ei élcVá'hj eeaZY'cdc#HhZb V&ZY
- '(\$X] ážg
- ')\$YZk'XZ

S' · · ô é ÿ ñ accessories

Inverter

; kZgnej b eXVcVZ b Vc\ZYI ↑ Vc'ckZgZg'] Zj c'hZfj 'eeZY' I ↑ Vc'ckZgZg] VZ VeggZj g' hZchdg' &# & Wg]] X] Xdb b j - c'XmZhl ↑ i] Z'ckZgZgi] g] \ V*#(&b 7 h'cV\$7 aig' j a] t'c' eVg] b ZiZghVg' e'g' a] WZY Yj g'e i] ZiZhi e\ e] VhZ' e i] Z [Vxidgr\$ I] Zj hZg] Vh'dcan' id' hZAZi i] Z' hZi' ed'ci' kVj Z' [dgi] Z' i' VciZY' e'g'hj g' \$

Kit with electric anti-freeze resistor

I] Z' ↑ h'chVazY' e i] Z' chYZ' d[i] Z' iVc' VcY' Vh'Vc' ZAZigX' g' h'hdgd[') &&L [dgiVc' h] e id' &&& aVcY il d ZAZigX' g' h'hdgd[d[') &&L [dgiVc' h] i] V' a] g' ZgXVeVX' tr\$] Z' ↑ V' and' XdcVch' V' Vci # [g' ZAZ' W] Zg' dhi V' i# +%) + 19Z' VcY' h' VhZb VZ' Y' "XWZ' Y' VcY' iZhiZY' VZ [dg' YZakZgr\$

Timer for alternative pumps

ē i] Z' kZg' h'c1 ↑ Ydj VZ' ej b e' i] Zi' b ZgXVc VZ j hZY id' b Vc- VZ i] Z' h] fi' VZil ZZc' i] Z' ej b eh' e' ciZg' Vh' d[V' YZiZg' eZY' i' b Z\$ L ↑ dj i' i] Zi' b Zg' i] Z' h] fi' VZil ZZc' ej b eh' h'XVg' ZY' dj i' I ↑ ZkZg' h' Vg' j e \$

Attention

↑ i] Z' h' h' Zb' h' V' i' kZ' (*% i] Z' h] fi' VZil ZZc' ej b eh' h' cdi' \ j Vg' ciZZY' V' i] Z' h' VcY' Vg' \ g] e \$ ē i] h' X' hZ' ↑ h' g' Xdb - b ZcY' ZY id' j hZ' V' i' b Zg\$

: ^ Zg' ci V' aeg' Zj g' h' ↑ X]

I] h' h' Vh' [Zinb ZVj g' i]] X] b V Zh' ↑ ed' h' VZ id' kZg' ni] Z' d[e i] Z' h' h' Zb \$] Z' YZk' XZ \ ZcZg' iZ h' Vc' V' a] g' h' c' V' a] j' i' YdZ' h' cdi' Vj id' b V' X' Van' h' id' i] Z' YZk' XZ \$

Soundproof covering

i dj cYegld[XdkZg' e\ h' V' k' V' a] VZ' VcY' h' c' ^ X' V' cian' YZ' X' g' Vh' Zhi] Z' h' j' cY' Zb' h' h' c' V' i] Z' YZk' XZ \$

Anti-vibration feet

7' hZi' d[V' ci' # k' V' g' i' t' c' [ZZi' I] X] 'X' Vc' VZ' ej i' dc' i] Z' h] eed' g' kZ' ed' ci' h' d[i] Z' YZk' XZ \$] ZnVg' h' j eeaZY' cdc' # h' h' Zb VZ' Y \$

Filter

CZj h' aZg' i ↑ ' && b' Xg' l' c] dAZ' h' id' VZ' M' i' VX] ZY id' i] Z' dj ihYZ' d[i] Zj c' ↑ e' dg' Zg' id' egi' Z' X' i] Z' ej b e [g] b Vc' n' b' ej g' V' h' d[i] Z' YZk' XZ \$

Balancing valve

I] Z' kV' aZ' h' id' VZ' M' i' VX] ZY id' i] Z' dj ihYZ' e' dg' Zg' id' g' \ j aZ' i] Z' d[e i] Z' X' g' j ↑ \$' h' Z' h' e' Z' X' Van' g' Xdb b ZcY' ZY' e' YZk' XZhl ↑ V' kV' g' VZ' e' g' h' j g' Ygle \$

Packaging in a wooden case

Fg] iZ' X' i' kZ' eVX' V' e\ ' W' V' eiZY' id' g' h' n' i' g' / chedg' VcY' a' l' c\ ' Y' h' i' Vc' XZ \$

Package for overseas transport

; n' r] / eVX' V' e\ [d] b' Vg' b' Z' i' g' / chedg' I ↑ ' V' i' dd' YZc' X' h' Z' e' V' X' d' g' Vc' XZ' I ↑ i] Z' e' i' Z' g' V' i' t' c' V' a' h' i' Vc' Y' V' g' h' ? FC# + " V' egi' Z' X' i' kZ' V' a' VcY'] n' g] h' X' de' X' h' V' a \$

Kit to transform couplings

I] Z' ↑ X' dci' V' ch' i' l' d' d' c' i' h' l'] X] i' g' / ch' [d] g' b' i] Z' K' X' i' V' j aX' X' dj eac\ d[i] Z' > F' (\$' j' c' ↑ e' J' D' #' D' F' D' , ' Vc\ZY' X' dj eac\ h' l'] Z' g' ' h' V' kZ' g' h' c' l' ↑ i] Z' h' M' b' Z' Y' M' b' ZiZg' V' h' i] Z' X' dj - eac\ h' VcY' V' cdi] Z' g' kZ' g' h' c' l' ↑ V' V' a' \ Z' g' Y' ^ V' b' ZiZg' V' k' V' a' V' aZ' \$



I g' / ch' [d] g' b' V' i' t' c' i' d' V' Vc\ZY' X' dj eac\

| Original coupling Victaulic | Transformed coupling UNI-EN PN 16 | Code | price |
|-----------------------------|-----------------------------------|----------------|-------|
| 1 1/2" | ": D* &" | .). & ' (*-M | |
| | ": D+ &" | .). & ' (* . M | |
| 2" | ": D+ &" | .). & ' (* / M | |
| | ": D, + " | .). & ' (+ & M | |
| 2 1/2" | ": D, + " | .). & ' (+ M | |
| | ": D. &" | .). & ' (+ (M | |
| 3" | ": D. &" | .). & ' (+) M | |
| | ": D' &&" | .). & ' (+* M | |
| 4" | ": D' &&" | .). & ' (+ + M | |
| | ": D' (+ " | .). & ' (+, M | |