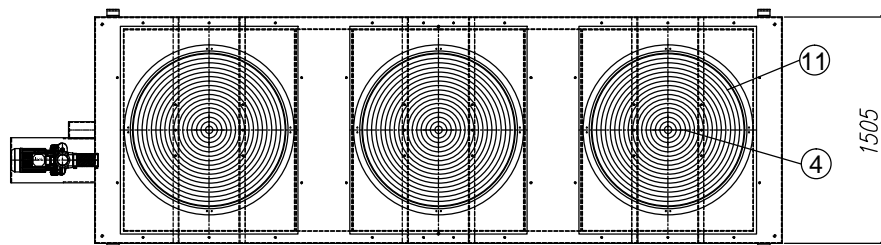
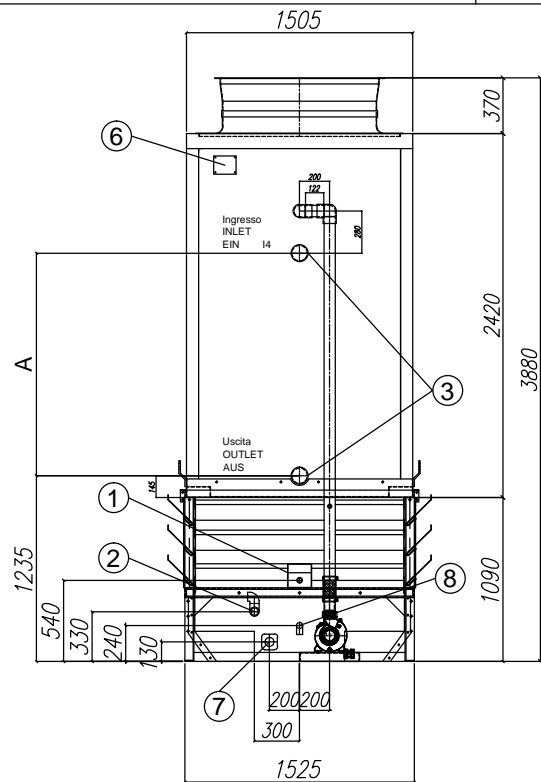
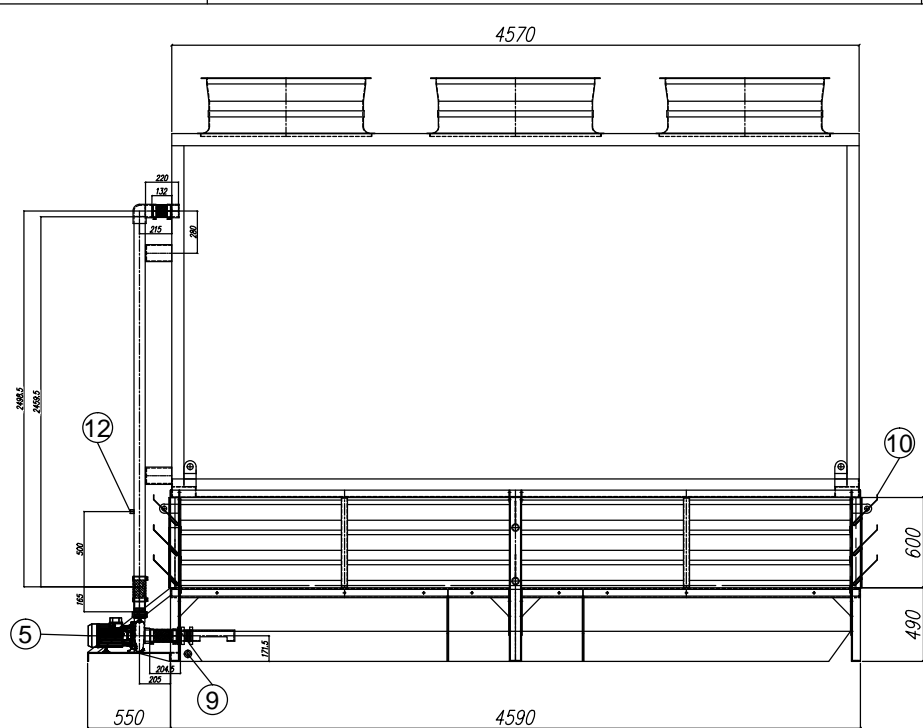


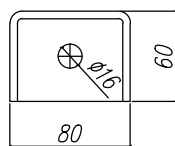
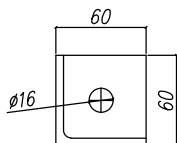
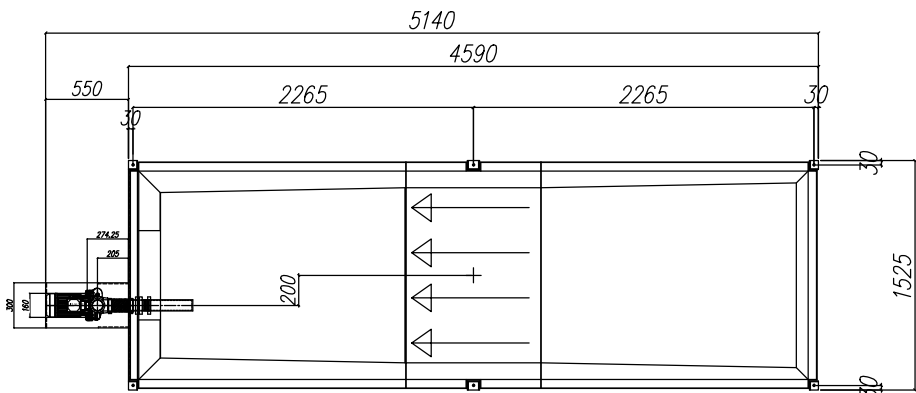
MITA Selection cooler evaluation result MCC I4-017

TORWAR 27/35

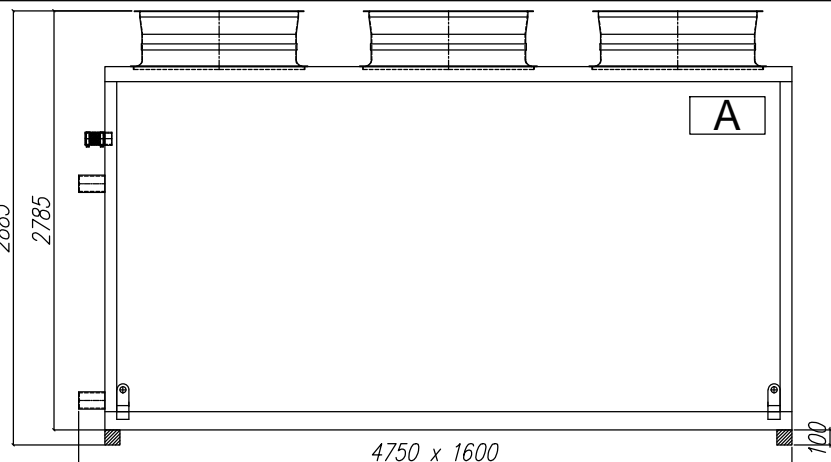
Selection parameters		
Functioning wet/dry	Wet	
Fluid	Glycol 35%	
Dry bulb temperature [°C]	34.0	
Wet bulb temperature [°C]	23.0	
Plant altitude [m]	100	
Fluid cooling [°C]	8.0	
Thermal power [kW]	445.0	
Evaluation parameters		
Model	MCC I4-017	
Collector diameter [mm]	100	
Pipes pressure drop [kPa]	30	
Fluid		
Description	Input	Outlet
Fluid temperature [°C]	35.6	27.6
Fluid speed [m/s]	0.81	0.81
Fluid volumetric flow [m3/h]	52.86	52.69
Air		
Description	Input	Outlet
Dry bulb temperature [°C]	34.0	27.2
Wet bulb temperature [°C]	23.0	27.2
Relative humidity [%]	38.7	100.0
Absolute humidity [g/kg]	13.5	23.3



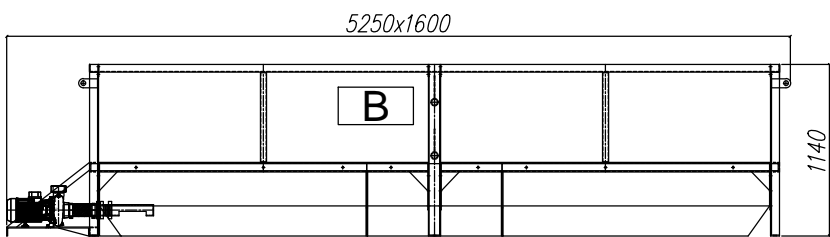
A	TIPO BATTERIA MOD.BATTERY ROHRBUENDEL TYP	INTERASSE COLLETORE BATTERIA MANIFOLD DISTANCE ROHRBUENDEL ACHSABSTAND A ±10 mm
MCC/MCE I4	12 RANGHI/ROWS/Rohrbuendel	1480 mm



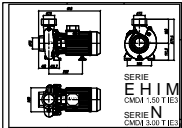
PRELIMINARE
PRELIMINARY



CONFIGURAZIONE TRASPORTO
TRANSPORT CONFIGURATION



DATO SINGOLA TORRE SINGLE TOWER DATA EINZELTUMR ANGABEN	PESO a vuoto corpo "A" WEIGHT (empty) Body "A" GEWICHT (leer) Gehaeuse "A"	PESO a vuoto Struttura "B" WEIGHT (empty) Basin "B" GEWICHT (leer) Unterteil "B"
MCC/MCE I4	3620	600



 ACHTUNG	Das Wasserbecken muss vollkommen waagrecht auf einer ebenen Fläche aufgestellt werden. Falls ein metallisches Untergestell notwendig ist, bitte auf 300mm maximale Schwellenteilung achten.	 ATTENTION	The bottom of the water tank must be positioned on a plane and continue surface. In case of superlevation it's necessary to realize a metallic structure composed of a perimetral frame and parallel steel max 300mm	 ATTENZIONE	Il fondo vasca dovrà essere opportunamente sostenuto adagiandolo su di una superficie piana oppure utilizzando delle traverse in normal profilato di sezione e forma idonea allo scopo ed aventi un passo di 300mm
MCC/MCE I4	GEWICHT LEER 4220	GEWICHT BETRIEB 8130	MCC/MCE I4	WEIGHT EMPTY 3670	WEIGHT IN OPERATION 7070
MCC/MCE I4	PESO A VUOTO 3670	PESO IN FUNZIONE 7070	MCC/MCE I4	PESO A VUOTO 3670	PESO IN FUNZIONE 7070

POS.	BESCHREIBUNG	Q.TY
12	ANSCHLUSS DIAMETER 1/2" GAS MIT INNENGEWINDE	1
11	VENTILATORSCHUTZGITTER	3
10	ZULUFTJALOUSIEN	KIT
9	WASSERABLASSTOEPSSEL Ø 1 1/4" GAS	1
8	TROCKENSCHUTZ FUER BECKENHEIZUNG (optional)	1
7	BECKENHEIZUNG (optional)	1
6	ELECTRIC BOX	1
5	MOTOR-PUMPE	1
4	MOTOR-LUEFTERGRUPPE	3
3	ROHRANSAETZE Ø4" AT WELD (DN100) (Ø114,3 mm sp.6,02)	2
2	UEBERLAUFANSCHLUSS Ø2" GAS(DN50) MIT AUSSENGEWINDE	1
1	SCHWIMMERVENTIL-ERGAENZUNGSWASSERAN. Ø1"GAS(DN25)male thread	1

POS.	DESCRIPTION	Q.TY
12	CONNECTION DIAMETER 1/2" GAS FEMALE THREADED	1
11	FAN GRID PROTECTION	3
10	AIR INTAKE FRP LOUVERS	KIT
9	DRAINAGE CAP Ø 1 1/4" GAS	1
8	MINIMUM LEVEL SWITCH (optional)	1
7	ELECTRIC HEATER (optional)	1
6	ELECTRIC BOX	1
5	MOTOR PUMP	1
4	MOTORFAN	3
3	INLET/OUTLET Ø4" AT WELD (DN100) (Ø114,3 mm sp.6,02)	2
2	OVER FLOW Ø2" GAS(DN50) MALE THREADED	1
1	MAKE UP Ø1" GAS(DN25) MALE THREAD	1

POS.	DESCRIZIONE	Q.TA
12	ATTACCO Ø1/2" GAS FEMMINA	1
11	RETE DI PROTEZIONE MOTOVENTILATORE	3
10	ALETTE INGRESSO ARIA	KIT
9	TAPPO DI SCARICO Ø 1 1/4" GAS	1
8	LIVELLOSTATO DI SICUREZZA (optional)	1
7	RESISTENZA ELETTRICA (optional)	1
6	SCATOLA DI DERIVAZIONE	1
5	ELETTROPOMPA	1
4	MOTORE VENTILATORE	3
3	BOCCHELLI INGRESSO/USCITA A SALDARE Ø4"(DN100)(Ø114,3mm sp.6,02)	2
2	TROPPO PIENO Ø2" GAS (DN50) FILETTATO MASCHIO	1
1	REINTEGRO A GALLEGGIANTE Ø1" GAS (DN25) FILETTATO MASCHIO	1

05					
04					
03					
02					
01					
Revisione	Data	Descrizione	Modificato da	Controllato da	Approvato da
Customer	Date	Description	Revised by	Checked by	Approved by
			MITA Cooling Technologies S.r.l. Via del Benessere,13 - I-27010 Siziano PV Ph. +39 0382 67599 Fax +39 0382 617640 E-mail: info@mitact.it		
TOLLERANZE / TOLERANCES DI FORMA E POSIZIONE SECONDO UNI 7258-73 / FORM AND POSITION ACCORDING TO UNI 7258-73 QUOTE SENZA INDICAZIONE DI TOLLERANZA SECONDO UNI-EN 22768 / DIMENSIONS WITH NO INDICATION OF TOLERANCE: AVERAGE DEGREE OF ACCURACY ACCORDING TO UNI-EN 22768					
Oggetto Subject			N° Disegno Drawing N°		
TORRE A CIRCUITO CHIUSO MCC I4-17 CONDENSATORE EVAPORATIVO MCE I4-17 CLOSED CIRCUIT COOLING TOWER MCC I4-17 EVAPORATIVE CONDENSER MCE I4-17			MCC-MCE I4-17.CVCS.R01		
Disegnato Drawn by			Luca A.		
Data Date			30.05.18		
Foglio Sheet			1di1		
Scala Scale			1:25		
Dim. Dim.			A1		
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nome file:

Plate Heat Exchanger



Technical specification

Customer :
Model : M10-BWREF
Project: : 2021 Lukasik
Item : 30109-02510

Date : 2021.04.13

Fluid		Ammonia	30.0%Eth.glycol
Mass flow rate	kg/s	0.8956	39.10
Fluid Condensed/Vapourized	kg/s	0.8956	0.000
Inlet temperature	°C	80.0	28.5
Dew point	°C	40.0	
Outlet temperature (vapor/liquid)	°C	40.0/37.6	36.0
Operating pressure (In/Out)	bara	15.5/15.5	
Pressure drop (Perm/Calculate)	kPa	/1.35	/87.2
Velocity connection (In/Out)	m/s	11.8/0.198	4.78/4.80
Heat Exchanged	kW	1100	
Mean Temperature Difference	K	7.3	
Relative directions of fluids		Countercurrent	
Nozzle orientation		S4 -> S3	S1 <- S2
Connections S1, S2, S3, S4:		Pipe SS WELDED	
Plate material / thickness		ALLOY 304 / 0.60 mm	
Sealing material		Welded	NBRP Clip-on
Ring Gasket		CR	
Pressure vessel code		PED, Category 4	
Fluid danger group		Dangerous	No Danger
Has risky vapour pressure		Yes	No
Design pressure	bar	25.0	16.0
Test pressure	bar	35.7	22.9
Design temperature	°C	100.0	50.0
Overall length x width x height	mm	1155 x 470 x 1115	
Flooded weight	kg	733	

The performance of the equipment is conditioned by the process media and process parameters being consistent with the provided customer data.

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Fluid Composition

Hot side
Ammonia
Condensing

Cold side
Eth.glycol
Liquid Heating

Ammonia	= 0.8956 kg/s	Eth.glycol	= 39.10 kg/s
inlet v/l	0.8956/0.000	inlet v/l	0.000/39.10
outlet v/l	0.00000005171/0.8956	outlet v/l	0.000/39.10

Physical Properties

(inlet/outlet)	Hot side Liquid	Vapour	Cold side Liquid	Vapour
Dens	508.3/577.3	9.685/11.31	1041/1038	
Sp.heat	5.511/4.961	2.753/3.498	3.743/3.759	
Visc	0.0803/0.113	0.0121/0.0107	1.73/1.43	
Th.Cond	0.412/0.494	0.0308/0.0265	0.489/0.491	
Bub. p.		40.0/40.0		
Dew point		40.0/40.0		
Mol.W.		17.03/17.03		
Cr.pr.		113.33/113.33		
Cr.Temp.		132.3/132.3		
Lat.heat		1095.2/1095.4		

Specyfikacja

Dane hydrauliczne

Wskaźnik minimalnej energochłonności (MEI)	0.4
Min. temperatura przetłaczanej cieczy T_{\min}	-20 °C
Maks. temperatura przetłaczanej cieczy T_{\max}	140 °C
Maks. temperatura otoczenia T_{\max}	40 °C
Maks. ciśnienie robocze P_N	16 bar
Zalecenie dotyczące konfiguracji	16 bar do 120°C, 13 bar do 140°C

Dane silnika

Przyłącze sieciowe	3~400 V, 50 Hz
Tolerancja napięcia	±10 %
Klasa sprawności energetycznej silnika	IE3
Znamionowa moc silnika P_2	15 kW
Prąd znamionowy I_N	26,8 A
Znamionowa prędkość obrotowa n	2900 1/min
Współczynnik mocy $\cos \varphi$	0.88
Sprawność silnika η_M 50 % η_M 50%	90,4 %
Sprawność silnika η_M 75 % η_M 75%	92,1 %
Sprawność silnika η_M 100 % η_M 100%	91,6 %
Uzwojenie silnika do 3 kW	-
Uzwojenie silnika od 4 kW	-
Klasa izolacji	F
Stopień ochrony silnika	IP55
Zabezpieczenie silnika	nie

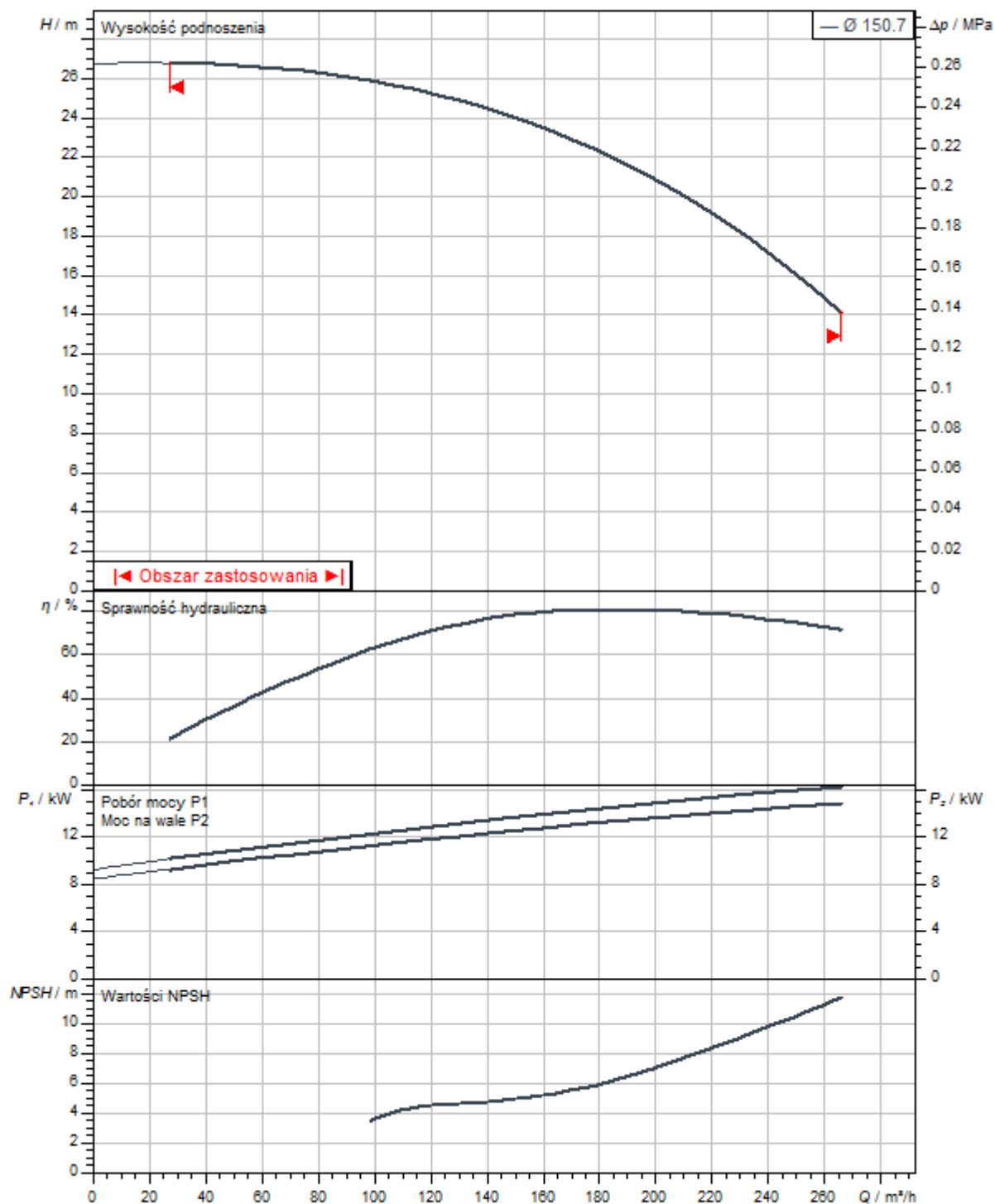
Materiały

Korpus pompy	5.1301/EN-GJL-250, z powłoką kataforetyczną
Wirnik	EN-GJL-200 (GG-20) Cast iron
Wał	Stal nierdzewna
Uszczelnienie mechaniczne	AQ1EGG
Latarnia	5.1301/EN-GJL-250, z powłoką kataforetyczną

Wymiary montażowe

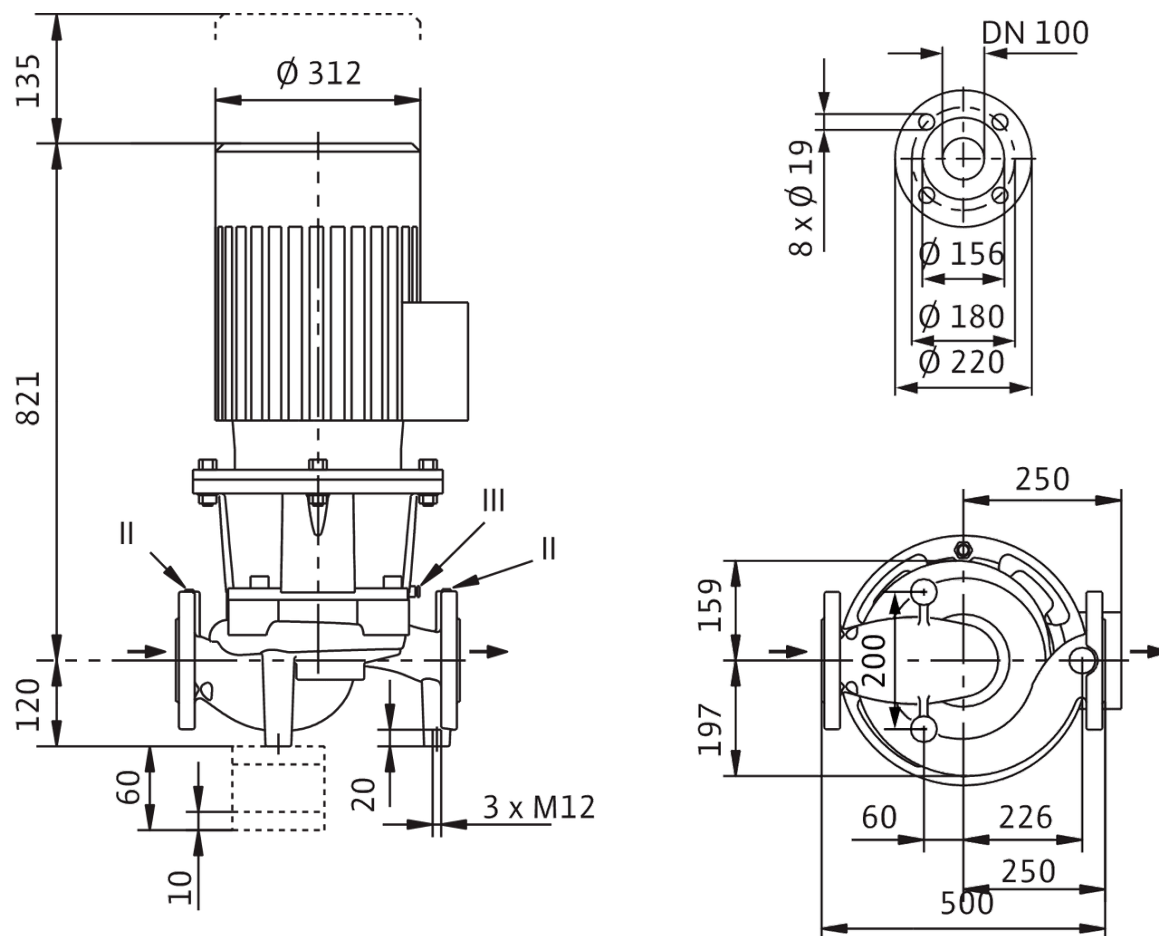
Przyłącze po stronie ssawnej	DN 100
Przyłącze po stronie tłocznej	DN 100
Długość montażowa l_0	500 mm

Charakterystyki

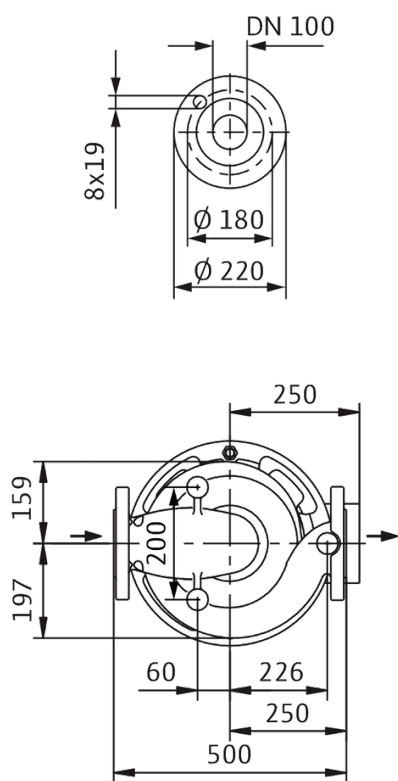
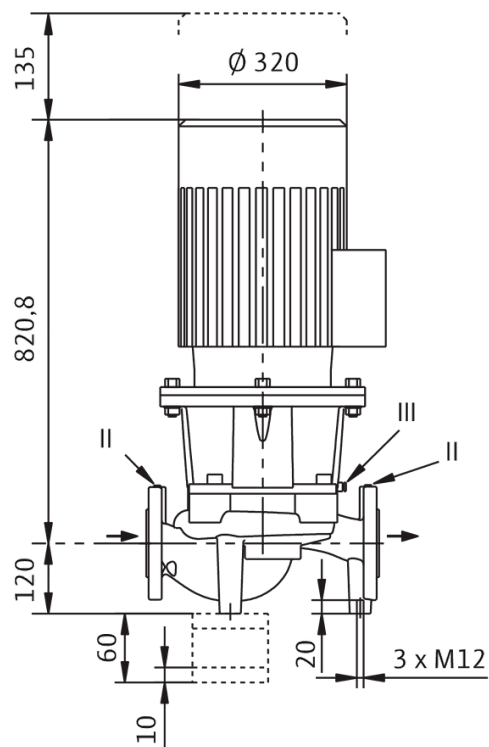


Wymiary i rysunki wymiarowe

IL

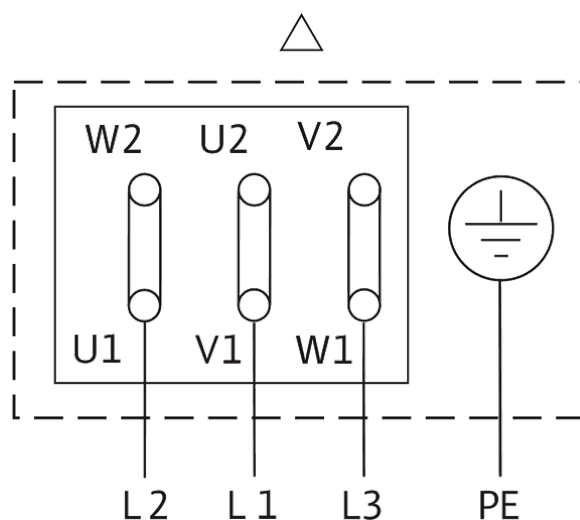
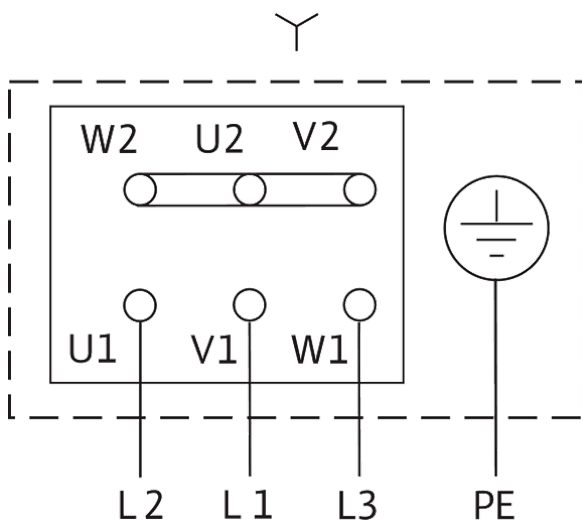
II Przyłącze pomiarowe ciśnienia R¹/₈; III Odpowietrzanie R¹/₈

CronoLine-IL 100/150-15/2



Schemat zacisków

IPL



Δ: Schemat połączenia w trójkąt

Y: Schemat połączenia gwiazdowego

Wymagany wyłącznik zabezpieczenia silnika na miejscu. Skontrolować kierunek obrotów! W celu zmiany kierunku obrotów, zamienić dwie dowolne fazy.

$P_2 \leq 3 \text{ kW}$ 3~400 V Y

3~230 V Δ

$P_2 \geq 4 \text{ kW}$ 3~690 V Y

3~400 V Δ

Po usunięciu mostków możliwy jest rozruch Y-Δ

Informacje dot. zamawiania

Ceny

Cena (bez VAT)	EUR 4.764,-
----------------	-------------

Dane produktu

Produkt	Wilo
Nazwa produktu	CronoLine-IL 100/150-15/2
Numer artykułu	2120926
Numer EAN	4048482217970
Kolor	Zielony
Minimalna ilość zamówienia	1
Dostępność na rynku	2014-09-01

Opakowanie

Liczba na warstwę	1
Właściwość opakowania	Opakowanie transportowe
Rodzaj opakowania	Europaleta
Liczba na paletę	1

Wymiary i masa

Długość z opakowaniem	1200 mm
Długość <i>L</i>	941 mm
Wysokość z opakowaniem	644 mm
Wysokość <i>H</i>	500 mm
Szerokość z opakowaniem	800 mm
Szerokość <i>W</i>	387 mm
Masa brutto ok. <i>m</i>	212 kg
Masa netto ok. <i>m</i>	187 kg

Specyfikacja ofertowa

Jednostopniowa dławnicowa pompa wirowa o konstrukcji Inline do montażu na rurociągu lub do ustawienia na fundamencie. Odporna na drgania, zapewniająca cichą pracę konstrukcja blokowa z latarnią i sztywno połączonym standardowym silnikiem kołnierзовym (silnik znormalizowany). Z niezależnym od kierunku obrotów mieszkowym uszczelnieniem mechanicznym z wymuszonym opływem oraz wirnikiem redukującym kawitację. Przyłącza kołnierzowe z przyłączami pomiarowymi ciśnienia R 1/8.

Korpus pompy i latarnia z powłoką kataforetyczną.

Dane eksploatacyjne

temperatura przetłaczanej cieczy T	-20 °C
temperatura otoczenia T	-15 °C
Maks. ciśnienie robocze P_N	16 bar
Zalecenie dotyczące konfiguracji	16 bar do 120°C, 13 bar do 140°C
Wskaźnik minimalnej energochłonności (MEI)	0.4

Dane silnika

Klasa sprawności energetycznej silnika	IE3
Przyłącze sieciowe	3~400 V, 50 Hz
Tolerancja napięcia	±10 %
Moc znamionowa P_2	15000 W
Znamionowa prędkość obrotowa n	2900 1/min
Prąd znamionowy I_N	26,8 A
Współczynnik mocy $\cos \varphi$	0.88
Sprawność silnika η_M 50 %	90,4 %
Sprawność silnika η_M 75 %	92,1 %
Sprawność silnika η_M 100 %	91,6 %
Klasa izolacji	F
Stopień ochrony	IP55

W wersji standardowej silniki w klasie IE3. Pompy z silnikami $\geq 5,5$ kW ... ≤ 55 kW są seryjnie wyposażone w czujniki termistorowe jako zabezpieczenie silnika.

Skrzynia zaciskowa do silnika $\leq 7,5$ kW może być wykonana z metalu lub tworzywa sztucznego. Jeśli bezwzględnie wymagana jest metalowa skrzynia zaciskowa, należy zamówić odpowiedni wariant specjalny. Skrzynie zaciskowe do silnika $> 7,5$ kW są zawsze z metalu.

Materiały

Korpus pompy	5.1301/EN-GJL-250, z powłoką kataforetyczną
Wirnik	Żeliwo
Wał	Stal nierdzewna
Uszczelnienie wału	AQ1EGG
Latarnia	5.1301/EN-GJL-250, z powłoką kataforetyczną

Wymiary montażowe

Przyłącze po stronie ssawnej	DN 100
Przyłącze po stronie tłocznej	DN 100

Informacje na temat umiejscowienia zamówień

Produkt	Wilo
Nazwa produktu	CronoLine-IL 100/150-15/2
Masa netto ok. m	187 kg
Numer artykułu	2120926

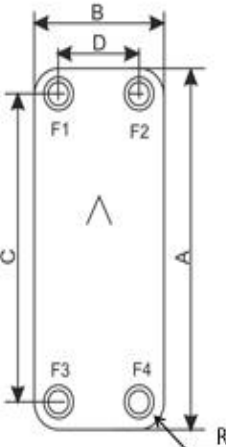

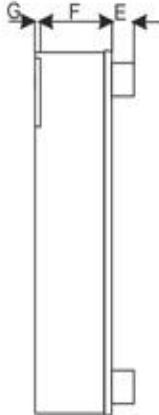
DUTY REQUIREMENTS	UNIT	SIDE 1	SIDE 2
Fluid		Propylene Glycol - Water (35,0 mass%)	Clavus68 (for NH3)
Flow type		Counter-Current	
Circuit		Inner	Outer
Heat load	kW		52,50
Inlet temperature	°C	28,00	88,39
Outlet temperature	°C	36,00	45,00
Flow rate	m ³ /h	6,021	2,450
Pressure drop (Design PD)	kPa	16,0 (60,00)	13,9 (20,00)
Thermal length		0,254	1,380

PLATE HEAT EXCHANGER	UNIT	SIDE 1	SIDE 2
Total heat transfer area	m ²		5,93
Heat flux	kW/m ²		8,86
Mean temperature difference	K		31,45
O.H.T.C. (available/required)	W/m ² , °C		352/282
Pressure drop - total*	kPa	16,0	13,9
- in ports	kPa	0,353	0,0506
Port diameter (up/down)	mm	50,0/50,0	50,0/50,0
Number of channels per pass		29	30
Number of plates			60
Oversurfacing	%		25
Fouling factor	m ² , °C/kW		0,699
Reynolds number		246,6	12,15
Port velocity (up/down)	m/s	0,852/0,852	0,353/0,353
Channel velocity	m/s	0,201	0,0804
Shear stress	Pa	26,2	23,1
Average wall temperature	°C	34,37	34,56
Largest wall temperature difference	K		1,08
Min./Max. wall temperature	°C	29,15/39,54	29,50/40,61

*Excluding pressure drop in connections.

PHYSICAL PROPERTIES	UNIT	SIDE 1	SIDE 2
Reference temperature	°C	32,00	66,70
Dynamic viscosity	cP	2,43	16,5
Dynamic viscosity - wall	cP	2,25	55,3
Density	kg/m ³	1028	861,8
Heat capacity	kJ/kg, °C	3,817	2,028
Thermal conductivity	W/m, °C	0,4326	0,1267
Film coefficient	W/m ² , °C	5220	386

DIMENSIONS

FRONT			BACK			SIDE		
								
A	mm	524 ±2						
B	mm	202 ±1						
C	mm	442 +1/-2						
D	mm	120 ±1						
E	mm	54 (opt. 27) ±2						
F*	mm	109,8 - 117,8 ±3%						
G*	mm	1 - 4 ±1						
R	mm	41,6						

* Dimensions depend on the selected product.

* This is a schematic sketch. For correct drawings please use the order drawing function or contact your SWEP representative.

W22 IE3 132 kW 2P 315S/M 3Ph 380-415/660//460 V 50 Hz IC411 - TEFC - B3R(E)

Product: 12881662

- Overview



Representative Image Only

The W22 motors are essential when it comes to energy saving. With superior efficiency levels, they reduce energy consumption, offer excellent cost effectiveness, and consequently greater productivity and lower costs for the industry.

The motors have high efficiency and comply with the efficiency level according to IEC 60034-30-1, and with the scope of the European Regulation.

Product features

Standard	IEC 60034-1
Frequency	50 Hz
Voltage	380-415/660//460 V
Number of poles	2
Degree of Protection	IP55
Synchronous speed	3000 rpm
Output rating	132 kW
Mounting	Foot-mounted
Flange	Without
Mounting	B3R(E)
Terminal box ¹	Right position
Enclosure	IC411 - TEFC

PRODUCT DETAILS

- Technical Data

[380/660 V 50 Hz 2P](#)

[400/690 V 50 Hz 2P](#)

[415 V 50 Hz 2P](#)

[460 V 60 Hz 2P](#)

Electric Motors

Frame	315S/M
Output	132 kW (175 HP)
Number of Poles	2
Frequency	50 Hz

Rated speed	2980 rpm
Slip	0.67 %
Rated voltage	400/690 V
Rated current	224/130 A
L. R. Amperes	1702/987 A
LRC	7.6
No load current	66.0/38.3 A
Rated torque	43.1 kgfm
Locked rotor torque	220 %
Breakdown torque	310 %
Locked rotor time	61s (cold) 34s (hot)
Moment of inertia (J)	1.96 kgm²
Design	N
Insulation Class	F
Service factor	1.00
Temperature rise	80 K
Duty Cycle	S1
Starting Method	Direct On Line
Ambient temperature	-20°C to +40°C
Altitude	1000 m.a.s.l.
Degree of Protection	IP55
Enclosure	IC411 - TEFC
Mounting	B3R(E)
Rotation¹	Both (CW and CCW)
Noise level²	77.0 dB(A)
Approx. weight³	1018 kg

(1) Looking the motor from the shaft end.; (2) Measured at 1m and with tolerance of +3dB(A).; (3) Approximate weight, subject to be changed after manufacturing process.; (4) At 100% of full load.

Efficiency

50%	75%	100%
94.5	95.4	95.6

Power factor

50%	75%	100%
0.78	0.86	0.89

Features

Frame Material	Cast Iron
Impregnation Method	Constant Resin Flow
Regreasing System	At Drive end and Non-drive end
Main terminal box hole	2xM63x1,5
Terminal Block	BMC - 6 pins
Shaft Locking Device	Without

Drain	Rubber, automatic
Shaft Material	SAE 1040/45 Carbon Steel <div><div></div><div></div><div></div><div></div></div>
Painting	RAL 5009 203A (ISO 12944 - C2)
Grounding Lugs	Double
Fan Cover material	Cast Iron
Tropicalized Painting	Without
Fan material	Plastic
Bearing cap	Yes- Bearing Cap
Winding thermal protection	Thermistor - 2 wires 1 per phase 155°C
Drip Cover	Without
Overload protector (phenolic)	Without overload protector

ABOUT THIS PRODUCT



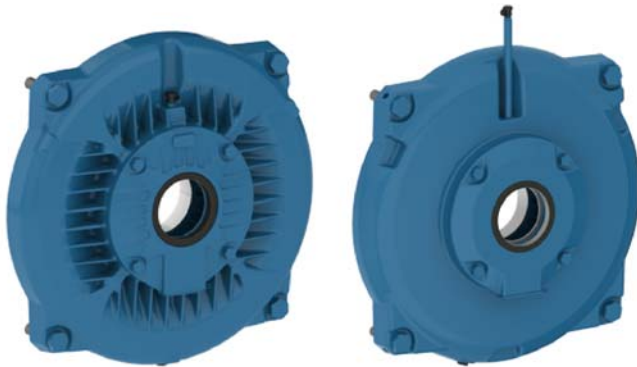
Ventilation System

The ventilation system design of the W22 line provides lower noise levels and allows a better distribution of the air flow over the motor, which minimizes hot spots on the surface and increases reliability and useful life.

- The fan cover made of cast iron offers greater impact resistance IEC 160 / NEMA 254T and larger and all IEEE 841 (IEC 63-132 / NEMA 143T-215T standard W22 are heavy gauge stamped Steel)
- Terminal box and eyebolts positioned so as to reduce the air flow dispersion
- Lower operating temperature on the bearings, resulting in longer lubrication intervals

Frame

The frame design reduces the air flow dispersion and contributes to increased heat exchange between the motor and the environment, reducing hot spots on the frame surface and extending the bearing lubrication intervals.



Endshields

Designed to improve the cooling and provide lower operating temperatures of the bearing, in addition to extending lubrication intervals.

D-Endshield

- Bearing hub displaced toward the outside of the endshield
- Lower operating temperature
- Robust structure to minimize vibration and increase heat dissipation

ND-Endshield

- Optimized air flow
- Reduction of noise levels
- Robust structure to minimize vibration

Terminal Box

The increase in the internal space of the terminal box simplifies the access to the terminals, ensuring easy and safe electrical connections during the installation and maintenance of the motor.

- The connection system of the terminal box allows easy modification of the motor mounting on the larger frames (IEC 225 / NEMA 447T and above), reducing the time to perform the change and the number of motors in stock.



ZEST WEG



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Phone: +27 11 723 6000

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W22 IE3 132 kW 2P 315S/M 3Ph 380-415/660//460 V 50 Hz IC411 - TEFC - B3R(E)

Product: 12881662

Overview

▼



Representative Image Only

The W22 motors are essential when it comes to energy saving. With superior efficiency levels, they reduce energy consumption, offer excellent cost effectiveness, and consequently greater productivity and lower costs for the industry.

The motors have high efficiency and comply with the efficiency level according to IEC 60034-30-1, and with the scope of the European Regulation.

Product features

Standard	IEC 60034-1
Frequency	50 Hz
Voltage	380-415/660//460 V
Number of poles	2
Degree of Protection	IP55
Synchronous speed	3000 rpm
Output rating	132 kW
Mounting	Foot-mounted
Flange	Without
Mounting	B3R(E)
Terminal box ¹	Right position
Enclosure	IC411 - TEFC

PRODUCT DETAILS

Performance curves

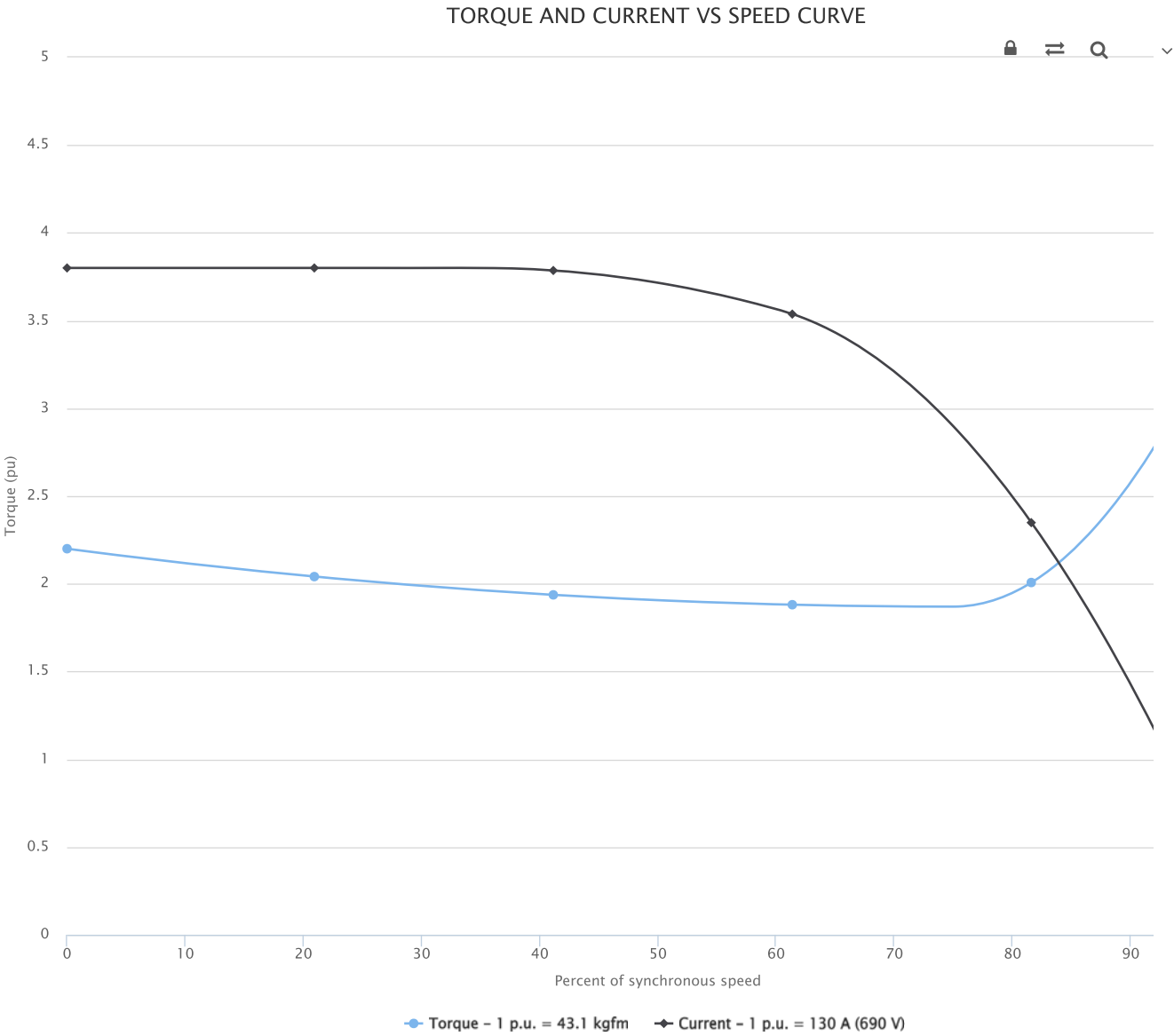
▼

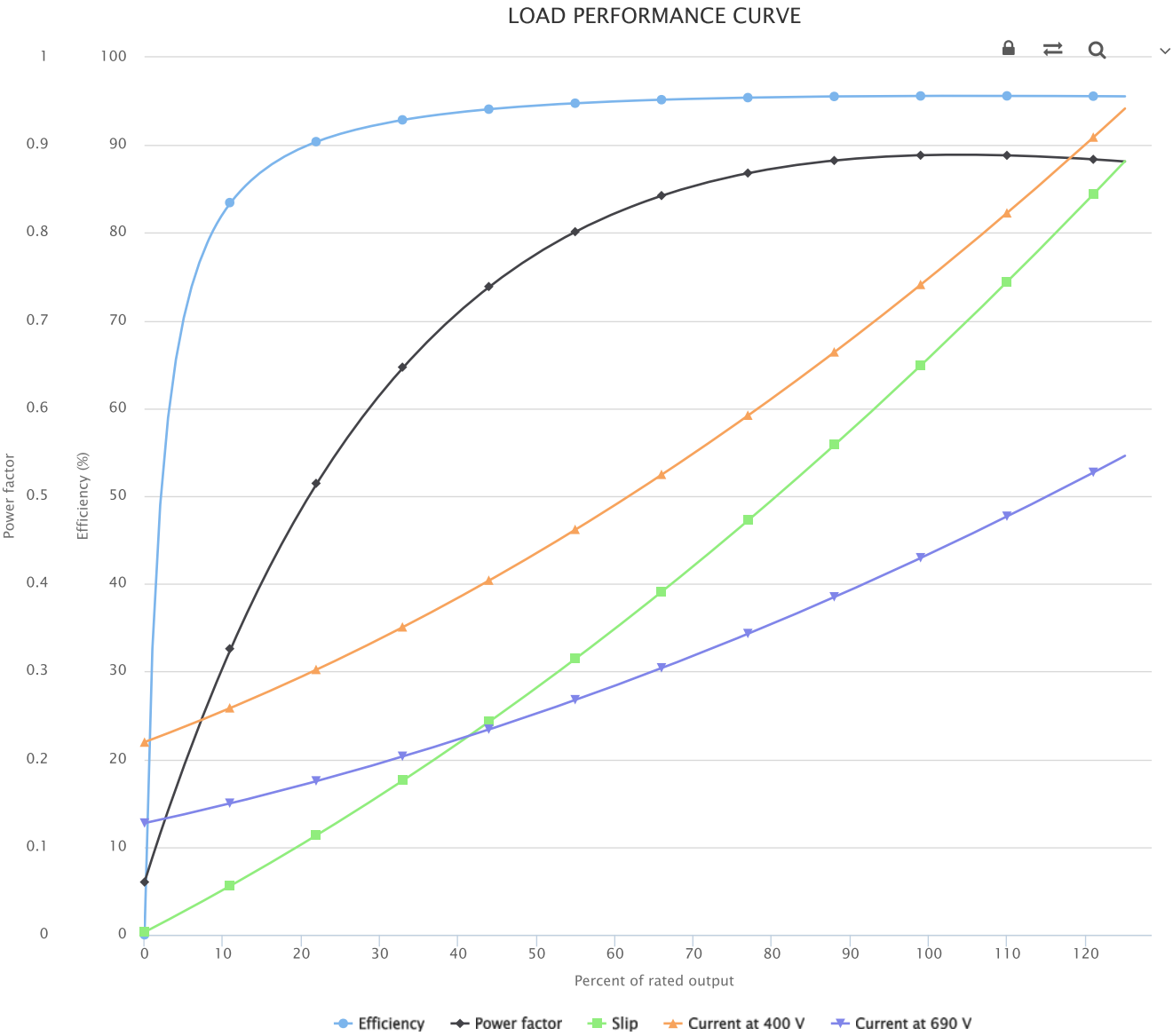
[380/660 V 50 Hz 2P](#)

[400/690 V 50 Hz 2P](#)

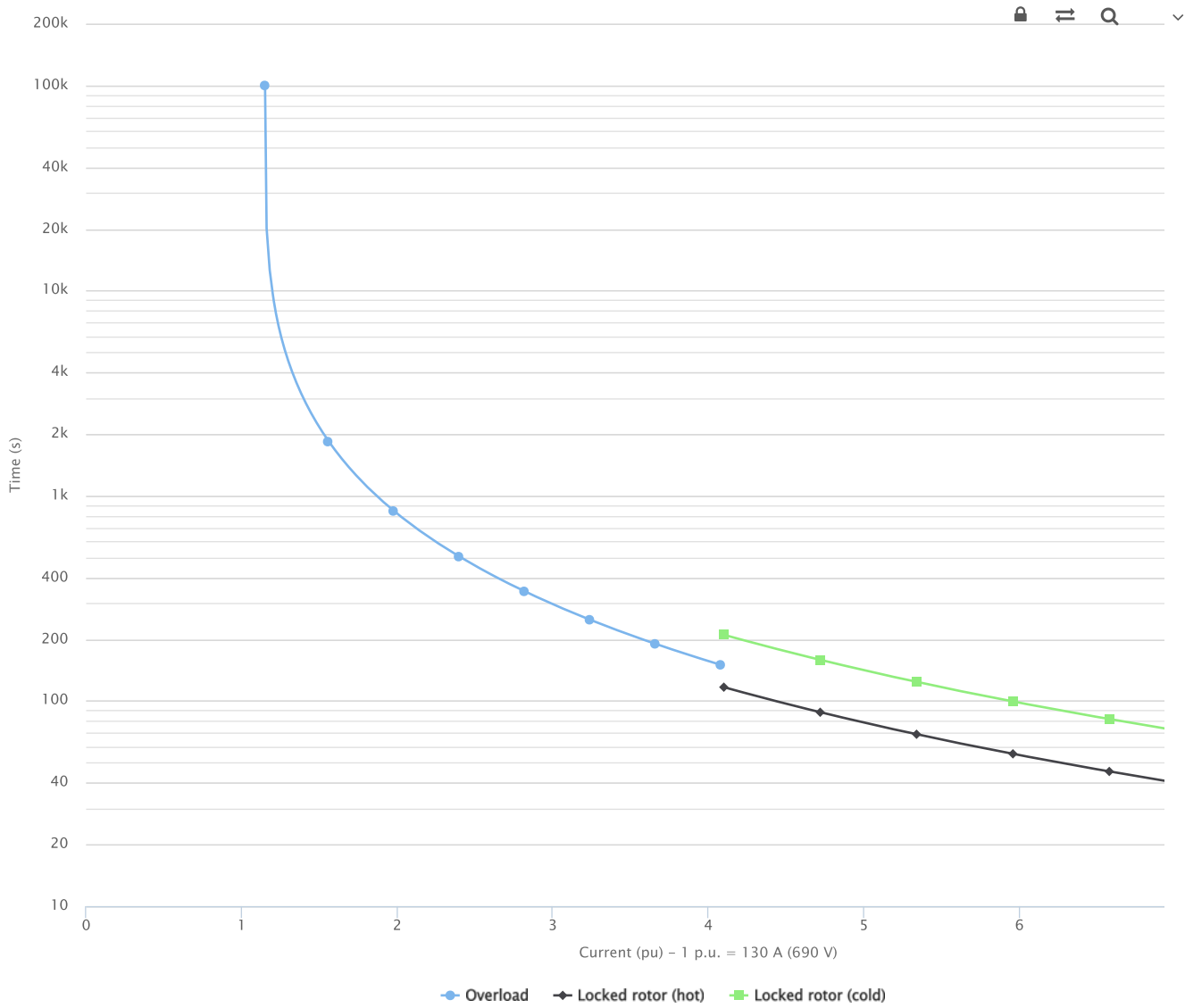
[415 V 50 Hz 2P](#)

[460 V 60 Hz 2P](#)

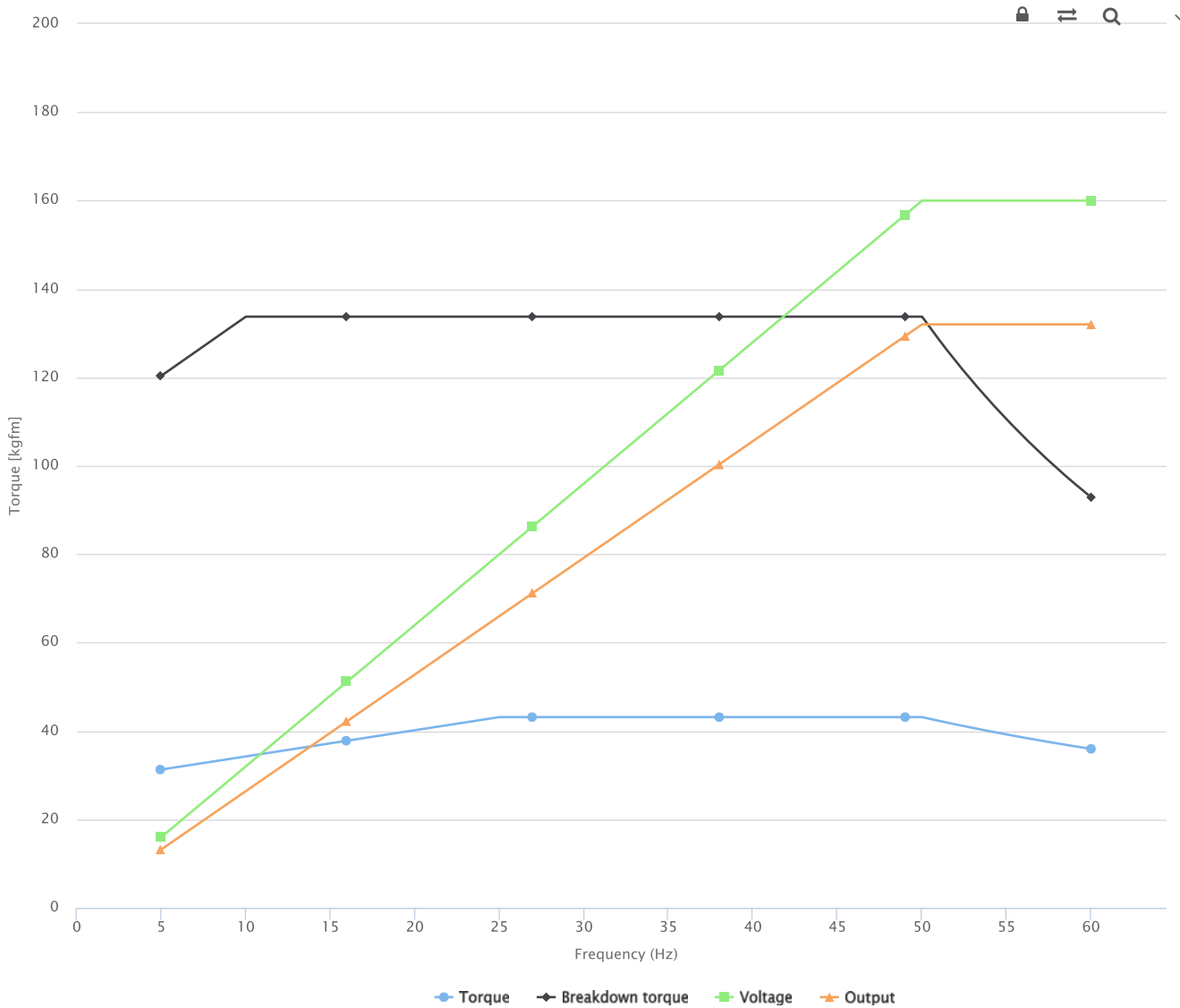




THERMAL LIMIT CURVE



VFD OPERATION CURVE



ABOUT THIS PRODUCT

W22

Indicated to the most variety of industrial applications

Unit

Compressor size	HSO 3221
Volume Ratio	2.2
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	1000
Suction	°C	-10
Delivery	°C	20
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

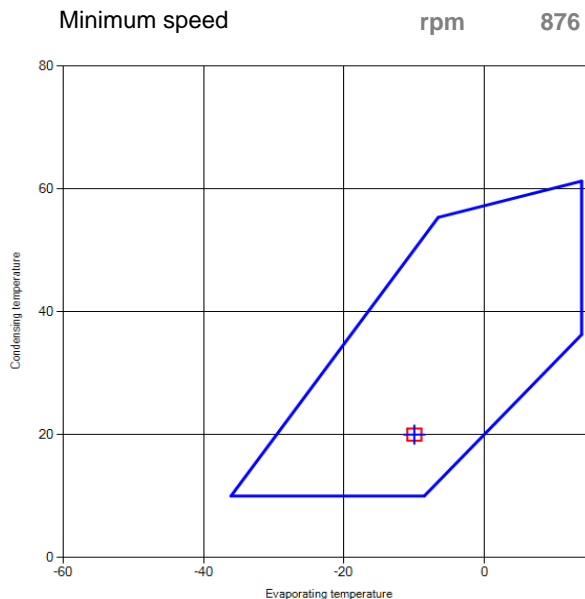
Performance

Capacity	kW	100.1
Shaft power	kW	17.5
COP		5.74
Suction mass flow rate	kg/s	0.09
Delivery Temperature	°C	54.4
Liquid temperature at expansion valve	°C	16

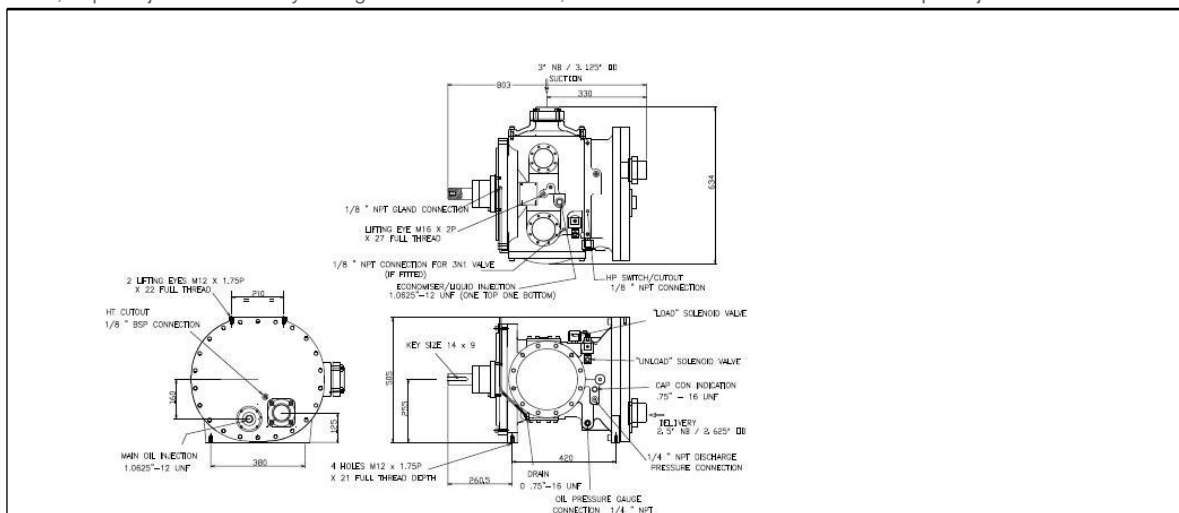
External oil cooling

Cooling Load	kW	7.23
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	1.6

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	2.2
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	3576
Suction	°C	-10
Delivery	°C	20
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

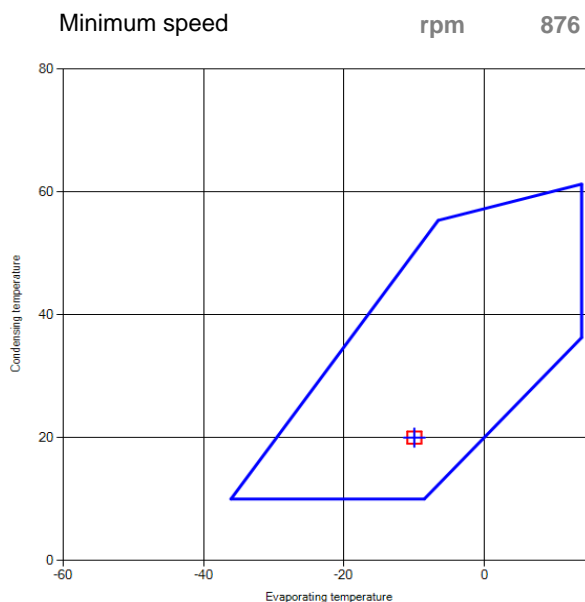
Performance

Capacity	kW	409.4
Shaft power	kW	62.4
COP		6.56
Suction mass flow rate	kg/s	0.35
Delivery Temperature	°C	62.2
Liquid temperature at expansion valve	°C	16

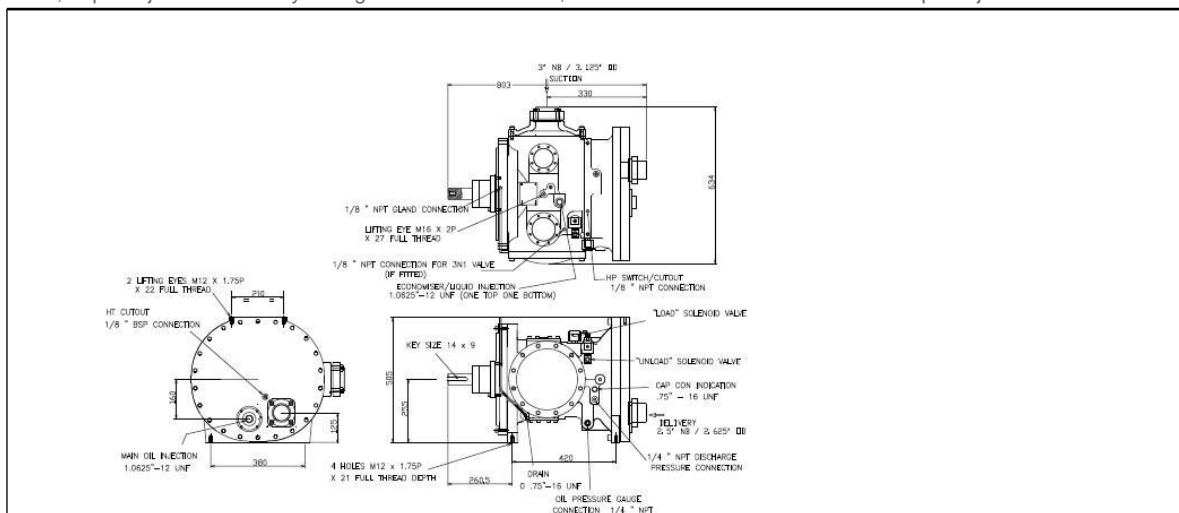
External oil cooling

Cooling Load	kW	13.17
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	1.6

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	1000
Suction	°C	-11.5
Delivery	°C	35
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

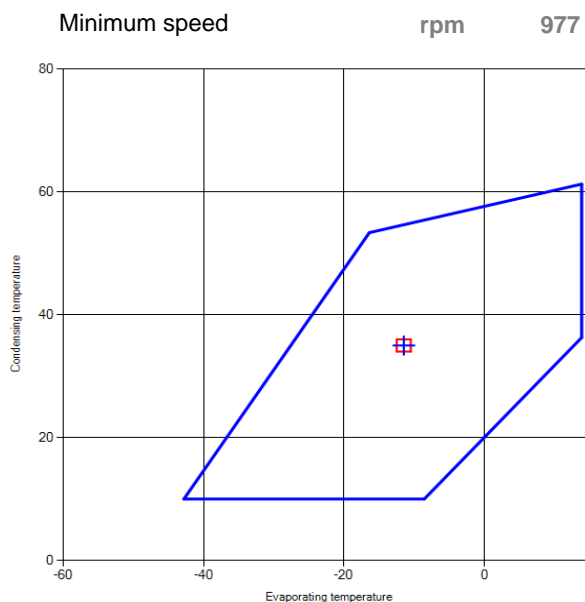
Performance

Capacity	kW	75.4
Shaft power	kW	26.7
COP		2.83
Suction mass flow rate	kg/s	0.07
Delivery Temperature	°C	62.5
Liquid temperature at expansion valve	°C	31

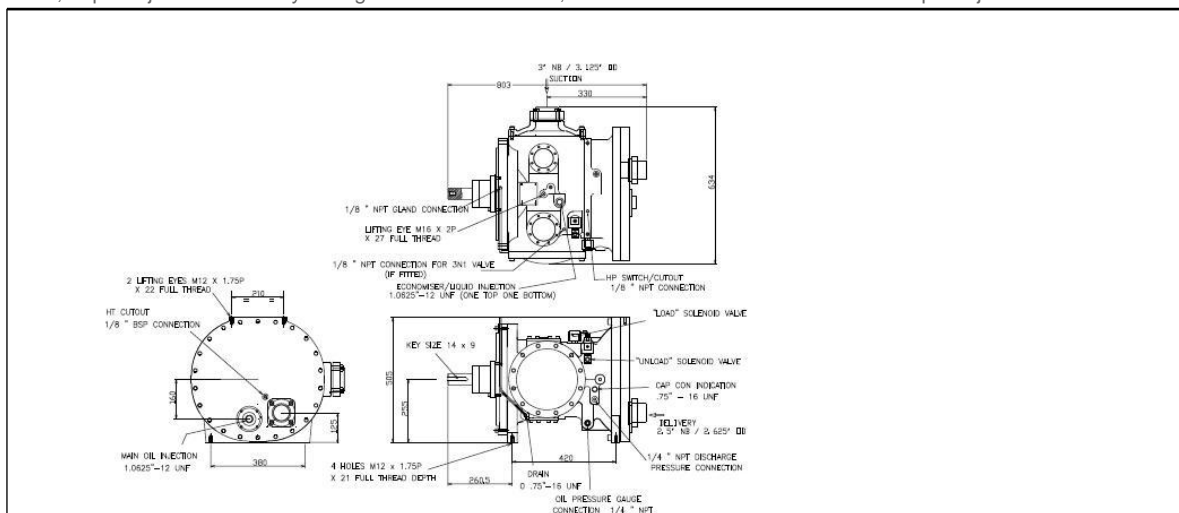
External oil cooling

Cooling Load	kW	18.73
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.23

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	3576
Suction	°C	-11.5
Delivery	°C	35
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

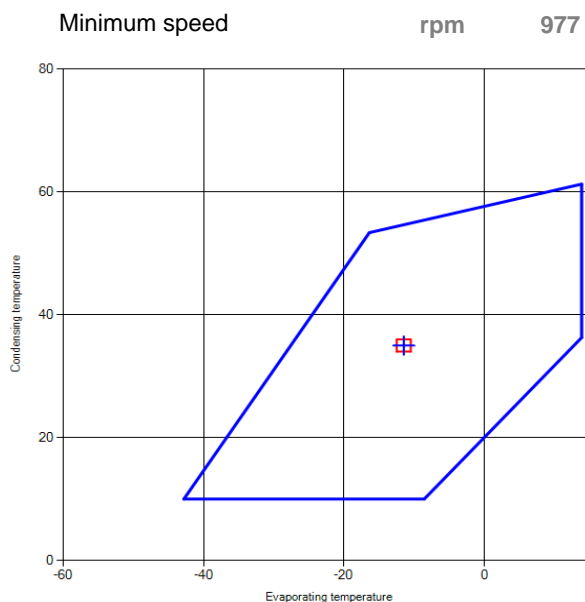
Performance

Capacity	kW	350
Shaft power	kW	95.4
COP		3.67
Suction mass flow rate	kg/s	0.32
Delivery Temperature	°C	82.5
Liquid temperature at expansion valve	°C	31

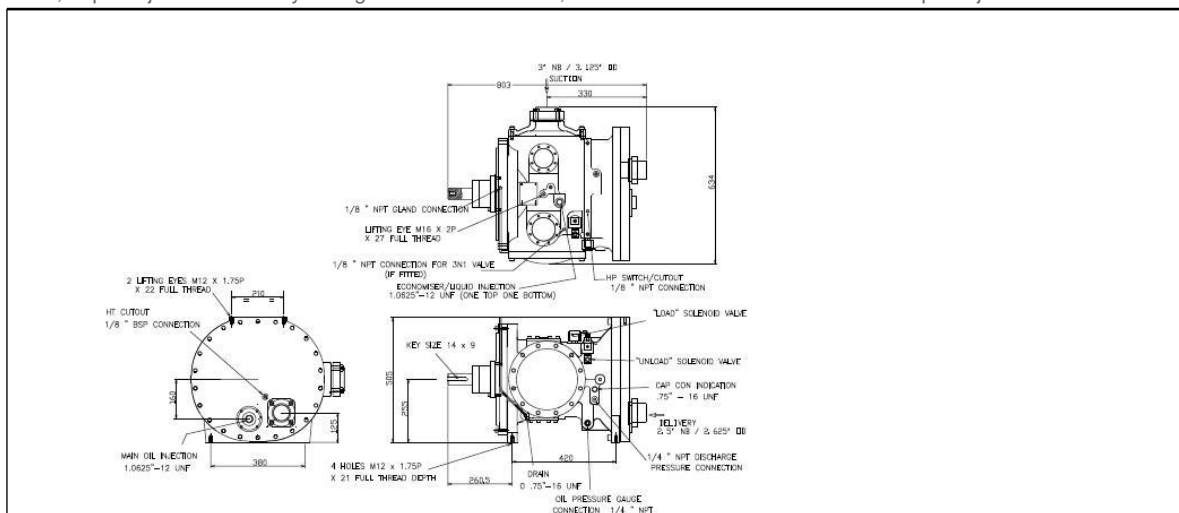
External oil cooling

Cooling Load	kW	40.07
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.23

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	2.2
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	1000
Suction	°C	-15
Delivery	°C	20
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

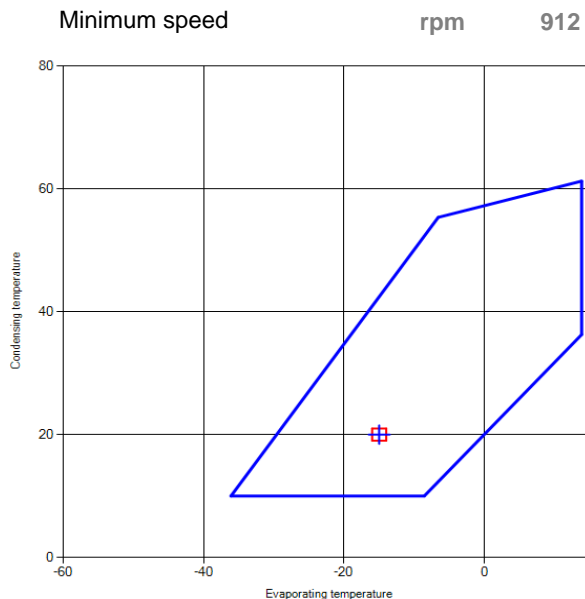
Performance

Capacity	kW	77.7
Shaft power	kW	17.7
COP		4.4
Suction mass flow rate	kg/s	0.07
Delivery Temperature	°C	55.7
Liquid temperature at expansion valve	°C	16

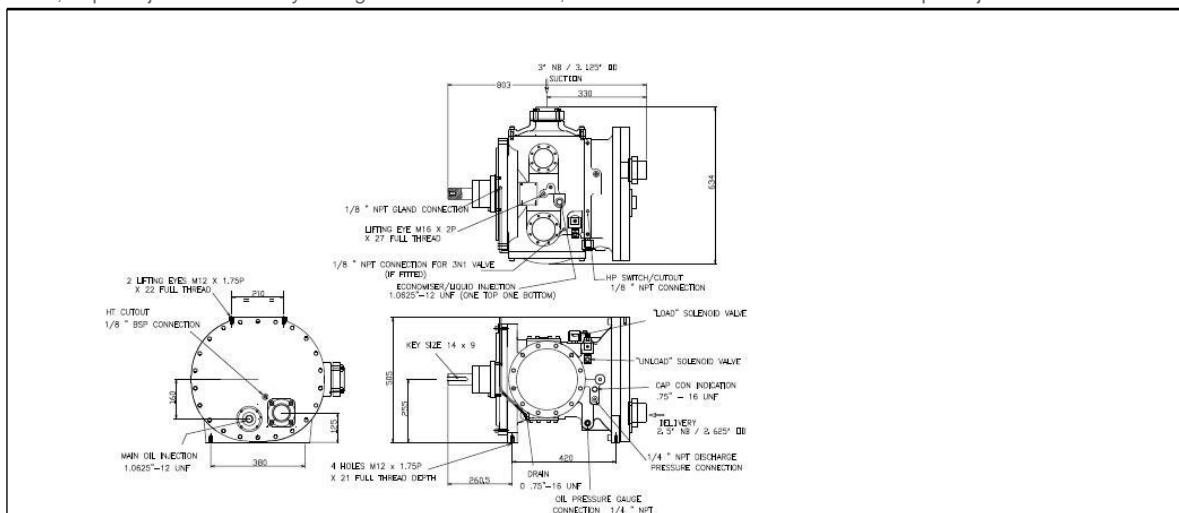
External oil cooling

Cooling Load	kW	9.01
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	1.76

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	2.2
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	3576
Suction	°C	-15
Delivery	°C	20
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

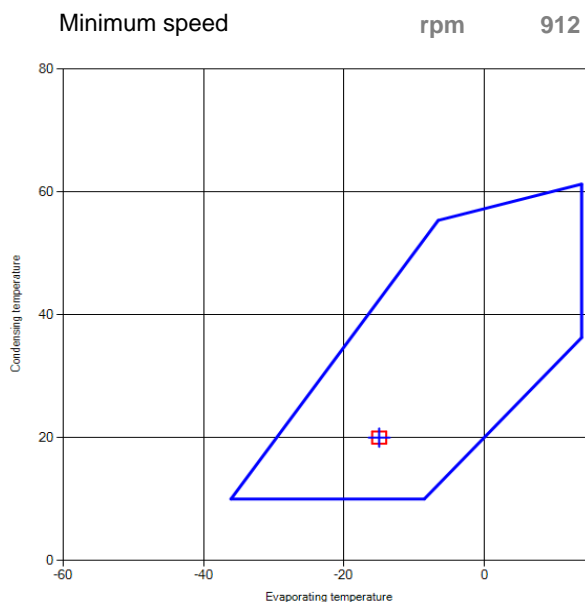
Performance

Capacity	kW	331.3
Shaft power	kW	63.1
COP		5.25
Suction mass flow rate	kg/s	0.28
Delivery Temperature	°C	66.3
Liquid temperature at expansion valve	°C	16

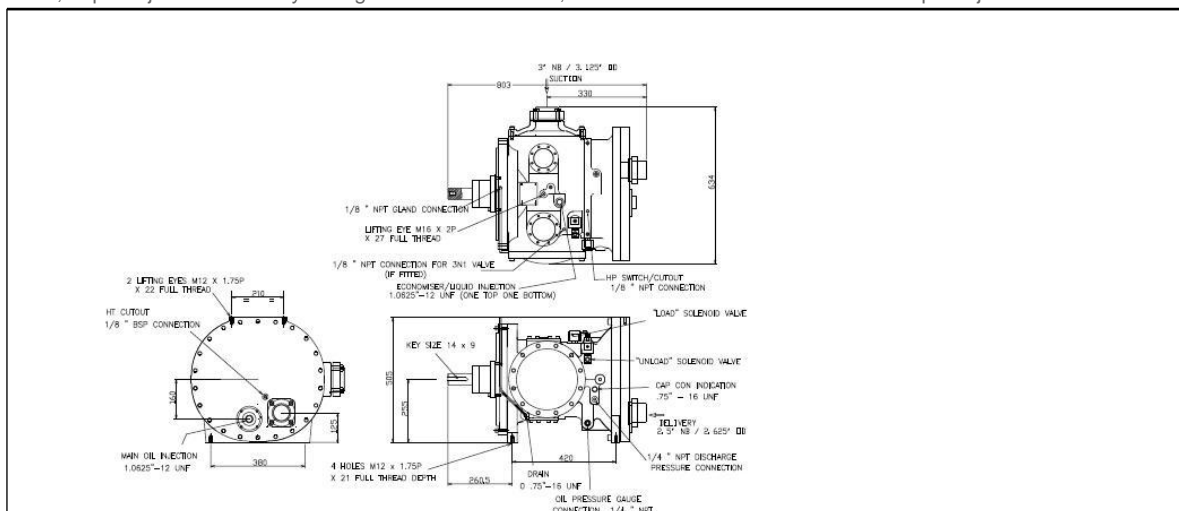
External oil cooling

Cooling Load	kW	17.97
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	1.76

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	1100
Suction	°C	-15
Delivery	°C	35
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

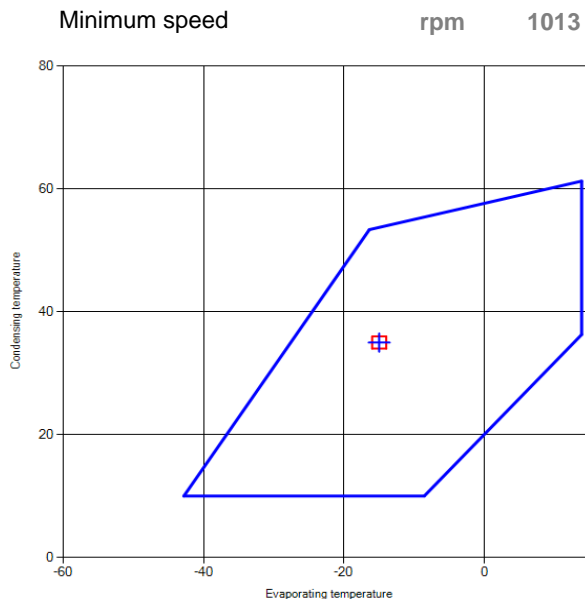
Performance

Capacity	kW	70.5
Shaft power	kW	28.6
COP		2.47
Suction mass flow rate	kg/s	0.06
Delivery Temperature	°C	63.7
Liquid temperature at expansion valve	°C	31

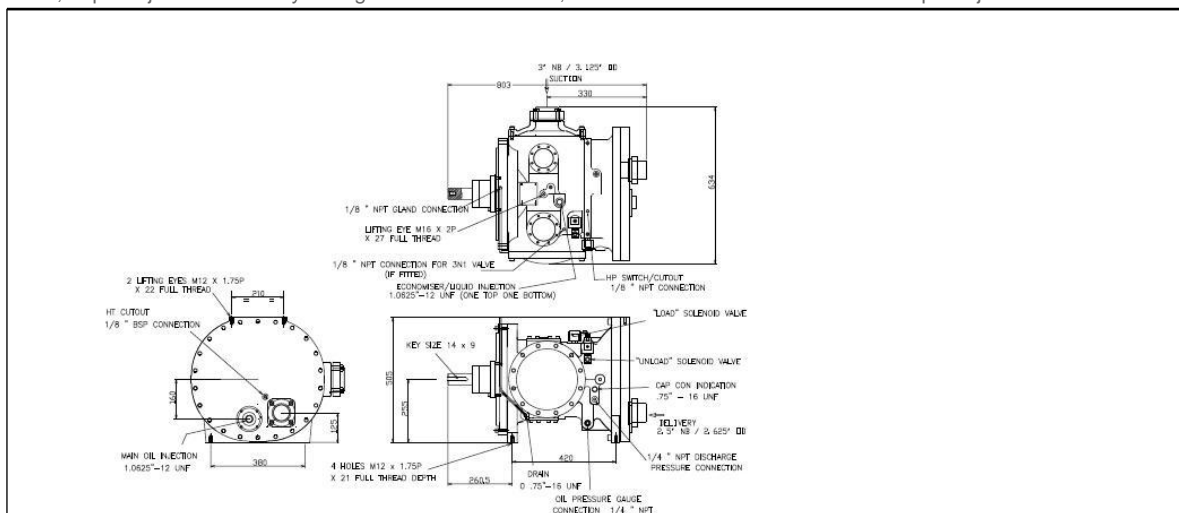
External oil cooling

Cooling Load	kW	20.56
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.3

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	3576
Suction	°C	-15
Delivery	°C	35
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

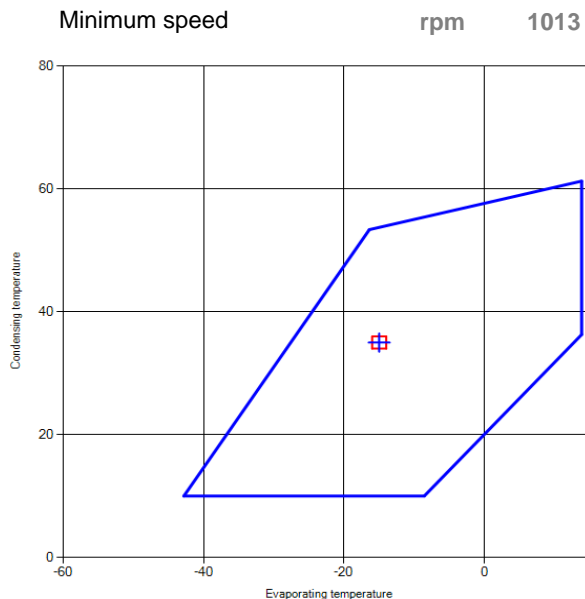
Performance

Capacity	kW	299
Shaft power	kW	92.8
COP		3.22
Suction mass flow rate	kg/s	0.27
Delivery Temperature	°C	84
Liquid temperature at expansion valve	°C	31

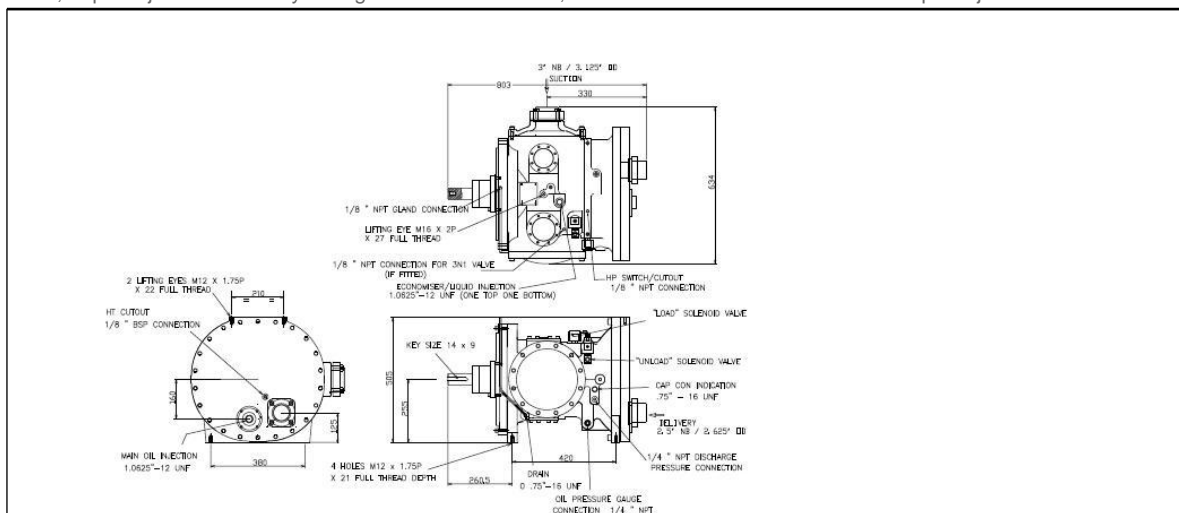
External oil cooling

Cooling Load	kW	42.88
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.3

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	1050
Suction	°C	-15
Delivery	°C	40
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

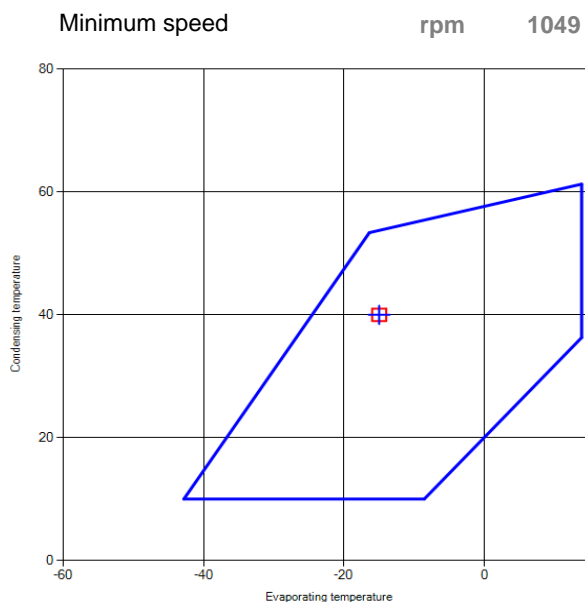
Performance

Capacity	kW	59.6
Shaft power	kW	30.5
COP		1.95
Suction mass flow rate	kg/s	0.06
Delivery Temperature	°C	65.4
Liquid temperature at expansion valve	°C	36

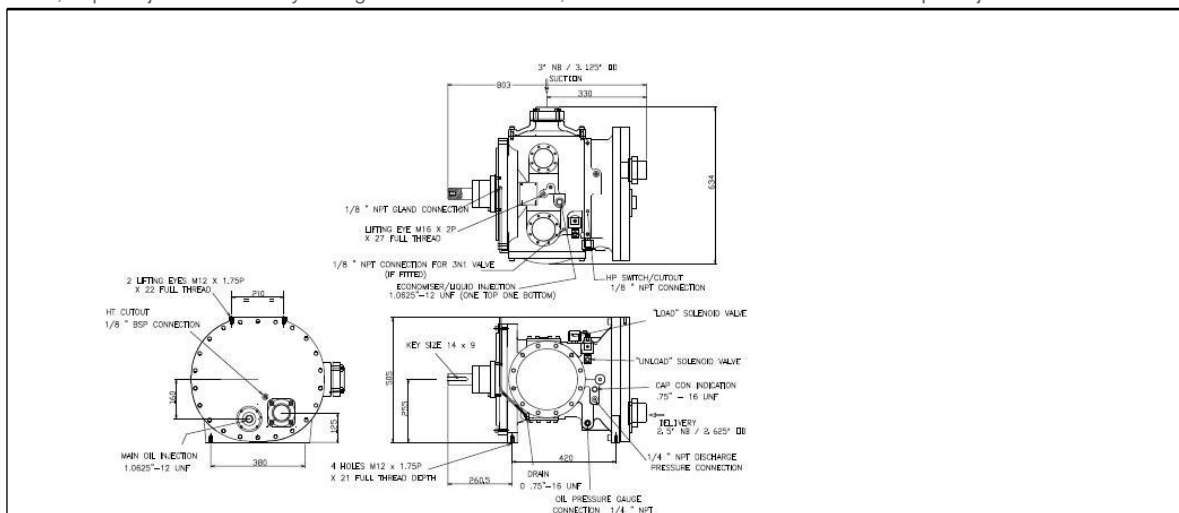
External oil cooling

Cooling Load	kW	23.93
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.45

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Unit

Compressor size	HSO 3221
Volume Ratio	3
Refrigerant	R717 (NH3)

Compressor cooling: external oil cooling
Not economised
Inverter drive

Conditions

Load	%	100
Speed	rpm	3576
Suction	°C	-15
Delivery	°C	40
Useful suction superheat	K	0
Total suction superheat	K	2
Liquid subcooling in condenser	K	4

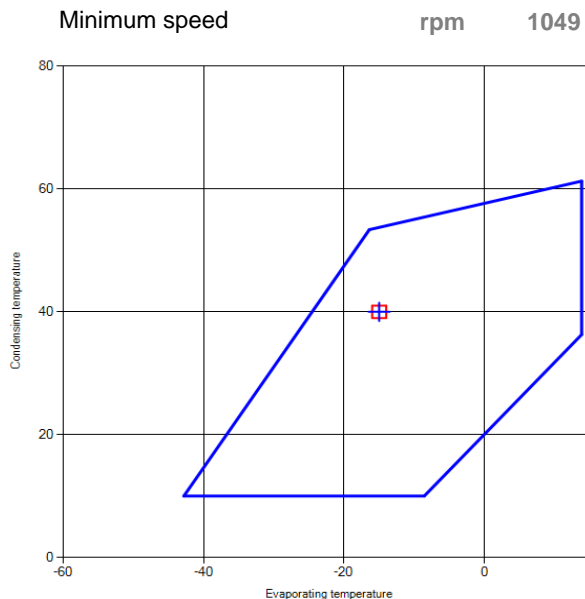
Performance

Capacity	kW	286.9
Shaft power	kW	103.8
COP		2.76
Suction mass flow rate	kg/s	0.27
Delivery Temperature	°C	89.8
Liquid temperature at expansion valve	°C	36

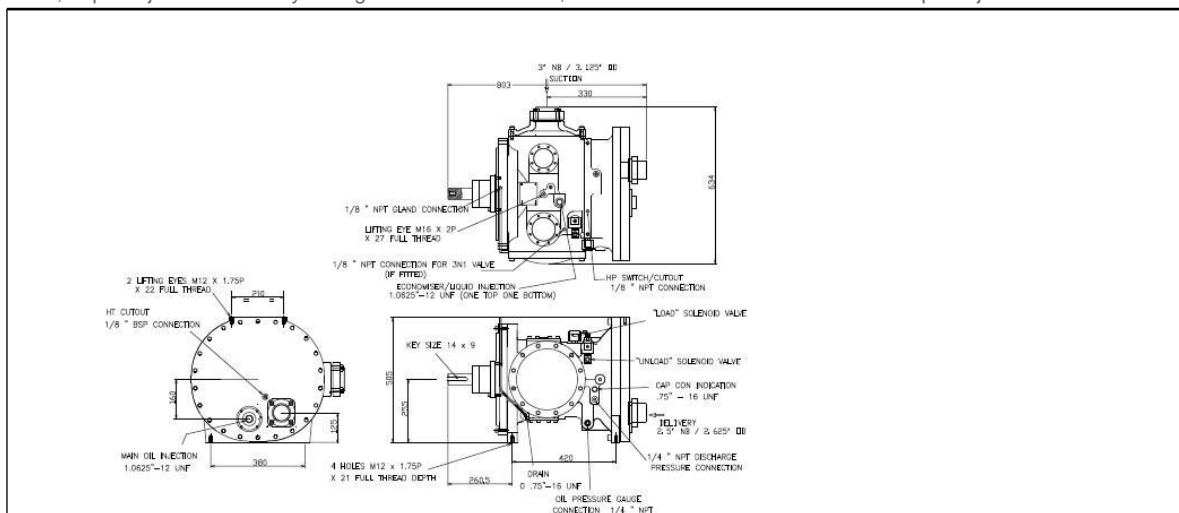
External oil cooling

Cooling Load	kW	52.48
Inlet oil temperature	°C	45
Oil injection flow rate	m3/h	2.45

OPERATION LIMITS



Note; Liquid injection load may be higher at minimum load, this should be checked to evaluate liquid injection valve selection



Performance tolerances are generally in accordance with EN12900.
Continuous research and development may necessitate changes to this data at any time

Notes

System Data

System Type	Oil-Management				
Line / Component Type	Oil Filter / Double-Oil Filter				
Mass flow	2017.100	kg/h	Volume flow	2.300	m³/h
Oil Density	877.00	kg/m³	Kinematic Viscosity	68	cSt

Component

Properties

Valve series	Oil Filter	DN-inlet	DN25
Articlenr.	OF AE MW25 DN25 PN25	DN-outlet	DN25
Articlecode	57700C12A5A60000		
Component Characteristics	Angle, Connection Type: Butt Welding End Type 1		
Comments			

Calculation Results

Mesh size	25.00	µm	Filterelement		
Max. Allowed Velocity	1.50	m/s	Real Velocity	1.00	m/s
Pressure drop	0.1013	bar			

Results
O.K.

Notes

System Data

System Type	Pump Circulation / Thermo Syphon				
Line / Component Type	Hot gas line				
Refrigerant	R717		Refrig. capacity	350.00	kW
Mass flow	1140.529	kg/h	Volume flow	135.561	m³/h

Data Evaporating Area

Evaporation temperature	-11.5	°C	Evaporating Pressure	2.734	bar
Overheating	1.0	K	Density Gas	2.245	kg/m³
Enthalpy	1451.4	kJ/kg			

Data Condensing

Condensing Temperature	35.0	°C	Condensing Pressure	13.508	bar
Supercooling	4.0	K	Density Liquid	593.629	kg/m³
Enthalpy	346.6	kJ/kg			

Data Hot Gas

Hot Gas Temp.	82.5	°C	Density Hot Gas	8.41	kg/m³
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Component

Properties

Valve series	Pressure Regulator	DN-inlet	DN50
Articlenr.	RVD E AE DN50 PN25	DN-outlet	DN50
Articlecode	42806C15A5A00000		
Component Characteristics	Angle, Set Pressure [bar (g)]: 6.00 bar (g), Connection Type: Butt Welding End Type 1		
Comments	Refrigerant: R717 T0: -11.5 TC: 35.0		

Calculation Results

Max. Allowed Velocity	17.00	m/s	Real Velocity	16.14	m/s
Pressure drop	0.0476	bar			

Results
O.K.

R1S

CRANE Serie CV

Rückschlagklappe

Swing Check Valve

DN50 - DN300 (2" to 12")

PS25 (PS40)

Kundenvorteile:

- geringer Druckverlust
- ruhige Arbeitsweise
- einteilige, - selbstzentrierende Scheibe
- gasdicht abschließend durch Weichdichtung
- (Leckrate 1 nach DIN 3230)
- kurze Baulänge
- geringes Gewicht

Customer Value Proposition:

- *low pressure drop*
- *smooth operation*
- *one-piece, - self disc*
- *gastight concluded by soft seal*
- *(leakage rate 1 to DIN 3230)*
- *short length*
- *low weight*



Kontakt/Contact:

Customer Service:

Parker Hannifin Ltd
Instrumentation Group
**Refrigeration and Air
Conditioning Europe**
Manvers House - Office 21
Pioneer Close
Wath Upon Dearne
Rotherham S63 7JZ
United Kingdom
Tel +44 (0) 1709 774600
Fax +44 (0) 1709 774601
racecustomerservice@parker.com

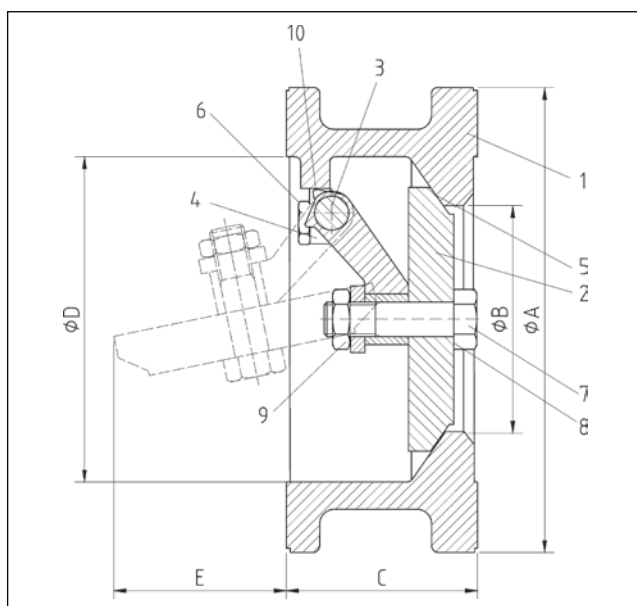
Produkt Merkmale / Product Features:

- Geeignet für Kältemittel nach: EN 378-1 (Anhang E).
Sole auf Anfrage.
- Medium Temperatur: -60°C bis +160°C
- Ausführung: DIN EN 12284, EN 378
- Baulänge: DIN 3203 K3
- Anschlüsse: Flansche nach EN1092 PN25/40 mit Nut oder ANSI 16.5 class 150 RF mit PS=19bar
- Konform der Richtlinie über Druckgeräte 2014/68/EU
- *Suitable for refrigerants acc. to: EN 378-1 (annex E).
Brines on request.*
- *Medium temperature -60°C to +160°C*
- *Design: DIN EN 12284, EN 378*
- *Length: DIN 3203 K3*
- *Connections: Flanges acc. to EN1092 PN25/40 with groove or acc. to ANSI 16.5 class 150 RF with PS=19bar*
- *Conformity to Pressure Equipment Directive 2014/68/EU*



ENGINEERING YOUR SUCCESS.

Technische Daten / Technical Data:



DN50-300

TS/°C	-60	-40	-10	+50	+100	+160	PS
PS/bar	6	18	25	25	18	17	28*

* Standard

DN50-200

PS/bar	10	30	40	40	28	26	42
--------	----	----	----	----	----	----	----

PS = MWB = max. zulässiger Betriebsüberdruck in bar Ü

TS = MWT = max. zulässige Betriebstemperatur in °C in Abhängigkeit von PS

PS = MWB = max. allowable working pressure in bar g

TS = MWT = max. allowable working temperature in °C associated with PS

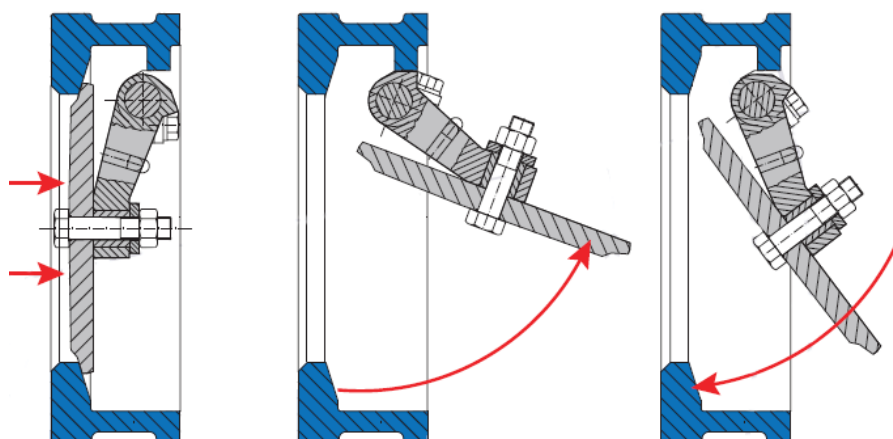
Dimensionen [mm] / Dimensions [mm]

DN	ØA		ØB	C	ØD	E	Kvs [m³/h]
	PN25	PN40					
50	102	102	40	43	60	12	40
65	121	121	48	46	72	20	65
80	133	133	60	64	91	25	110
100	162	162	78	64	113	42	215
125	192	192	99	70	140	63	380
150	218	218	118	76	167	84	590
200	273	273	158	89	218	112	1157
250	328	---	196	114	272	134	2050
300	378	---	236	114	322	147	3170

Öffnungsdruck ca 15mbar (mit einer Feder). Gasdichte Ausführung. Günstige Installation: Mit senkrecht stehender Halbachse in waagerechter Leitung. Einbau in senkrechter Lage nur mit Durchfluß von unten nach oben.

Opening pressure about 15mbar (with one spring). Gastight design. Best installation: Link shaft in vertical position installed in horizontal pipe. Installation in vertical pipe with flow direction upwards only.

Teil / Part	Material
1 Gehäuse / Body	1.0619/GP240GH
2 Scheibe / Disc	0.7040 vernickelt nickel plated
3 Hebel / Level	1.4408
4 Klemmstück / Schim	1.4301
5 Kegeldichtung Disc Seal	PTFE
6 Schrauben / Bolts	A2.70
7 Schrauben / Bolts	A2.70
8 Dichtung / Gasket	PTFE
9 Selbstsichernde Mutter Self locking Nut	A2.70
10 Feder / Spring	1.4310



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Ersetzt frühere Versionen / Replaces Prior Versions

Bulletin: 04-03-08-R1S-200306



Parker Hannifin Corporation
Instrumentation Group
Refrigeration and Air Conditioning Europe
Via Enrico Fermi, 5
20060 Gessate (Milano) - Italy
Tel: +39 02 95125.1 - www.parker.com/race

R1S.VA

CRANE Serie CV

Rückschlagklappe

Swing Check Valve

DN50 - DN300 (2" to 12")

PS25

Kundenvorteile:

- geringer Druckverlust
- ruhige Arbeitsweise
- einteilige, - selbstzentrierende Scheibe
- gasdicht abschließend durch Weichdichtung
- (Leckrate 1 nach DIN 3230)
- kurze Baulänge
- geringes Gewicht
- korrosionsbeständiger Sitz

Customer Value Proposition:

- *low pressure drop*
- *smooth operation*
- *one-piece, - self disc*
- *gastight concluded by soft seal*
- *(leakage rate 1 to DIN 3230)*
- *short length*
- *low weight*
- *corrosion resistant seat*



Kontakt/Contact:

Customer Service:

Parker Hannifin Ltd
Instrumentation Group
**Refrigeration and Air
Conditioning Europe**
Manvers House - Office 21
Pioneer Close
Wath Upon Dearne
Rotherham S63 7JZ
United Kingdom
Tel +44 (0) 1709 774600
Fax +44 (0) 1709 774601
racecustomerservice@parker.com

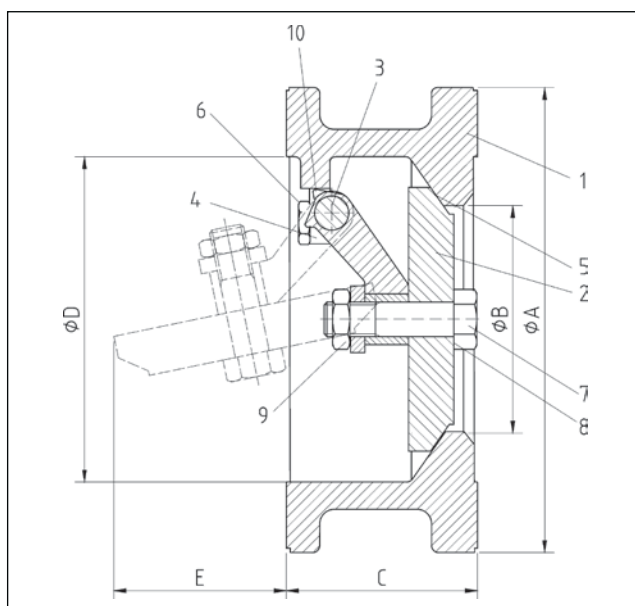
Produkt Merkmale / Product Features:

- Geeignet für Kältemittel nach: EN 378-1 (Anhang E).
Sole auf Anfrage.
- Medium Temperatur: -60°C bis +160°C
- Ausführung: DIN EN 12284, EN 378
- Baulänge: DIN 3203 K3
- Anschlüsse: Flansche nach EN1092 PN25/40 mit Nut oder ANSI 16.5 class 150 RF mit PS=19bar
- Konform der Richtlinie über Druckgeräte 2014/68/EU
- *Suitable for refrigerants acc. to: EN 378-1 (annex E).
Brines on request.*
- *Medium temperature -60°C to +160°C*
- *Design: DIN EN 12284, EN 378*
- *Length: DIN 3203 K3*
- *Connections: Flanges acc. to EN1092 PN25/40 with groove or acc. to ANSI 16.5 class 150 RF with PS=19bar*
- *Conformity to Pressure Equipment Directive 2014/68/EU*



ENGINEERING YOUR SUCCESS.

Technische Daten / Technical Data:



DN50-300

TS/°C	-60	-40	-10	+50	+100	+160	PS
PS/bar	6	18	25	25	18	17	28*

* Standard

PS = MWB = max. zulässiger Betriebsüberdruck in bar Ü

TS = MWT = max. zulässige Betriebstemperatur in °C in Abhängigkeit von PS

PS = MWB = max. allowable working pressure in bar g

TS = MWT = max. allowable working temperature in °C associated with PS

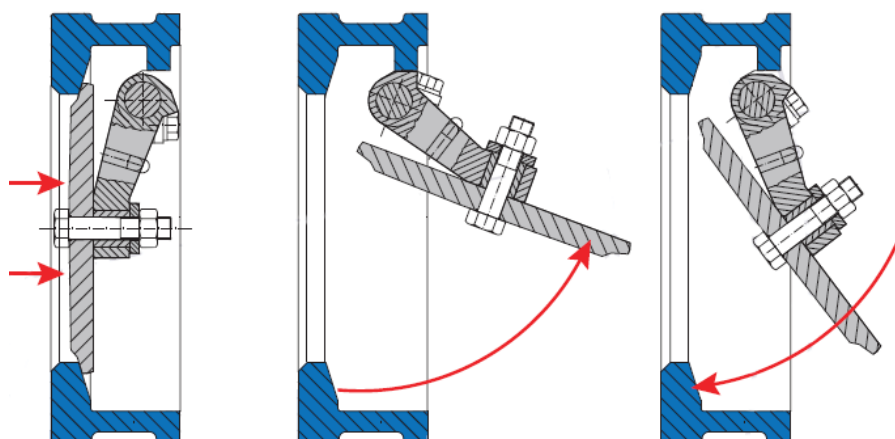
Dimensionen [mm] / Dimensions [mm]

DN	ØA		ØB	C	ØD	E	Kvs [m³/h]
	PN25	PN40					
50	102	102	40	43	60	12	40
65	121	121	48	46	72	20	65
80	133	133	60	64	91	25	110
100	162	162	78	64	113	42	215
125	192	192	99	70	140	63	380
150	218	218	118	76	167	84	590
200	273	273	158	89	218	112	1157
250	328	---	196	114	272	134	2050
300	378	---	236	114	322	147	3170

Öffnungsdruck ca 15mbar (mit einer Feder). Gasdichte Ausführung. Günstige Installation: Mit senkrecht stehender Halbachse in waagerechter Leitung. Einbau in senkrechter Lage nur mit Durchfluß von unten nach oben.

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