



CATALOGUE 2024

series 28 bar • series 45 bar (R410A)



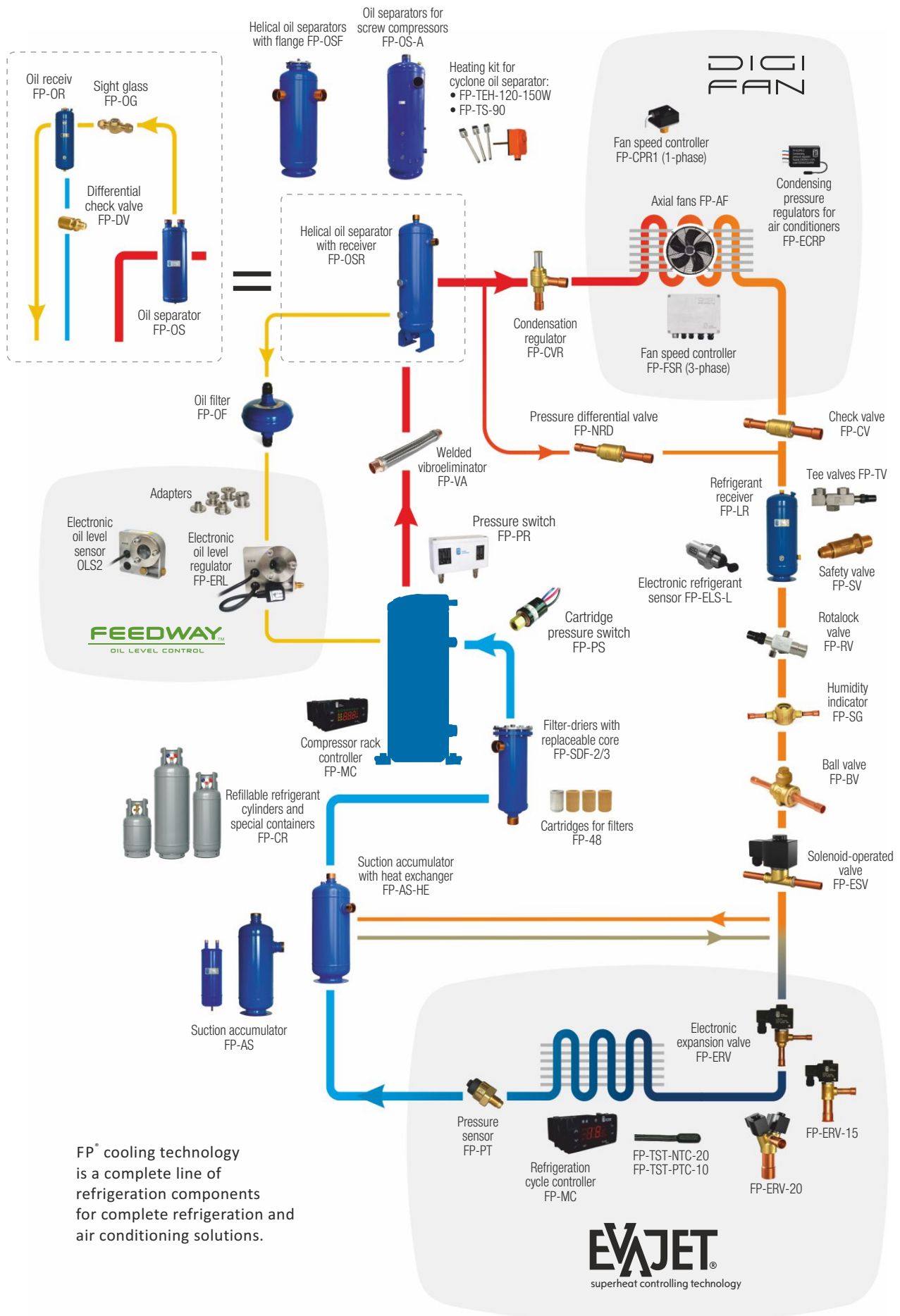
Pressure vessels



Linear components



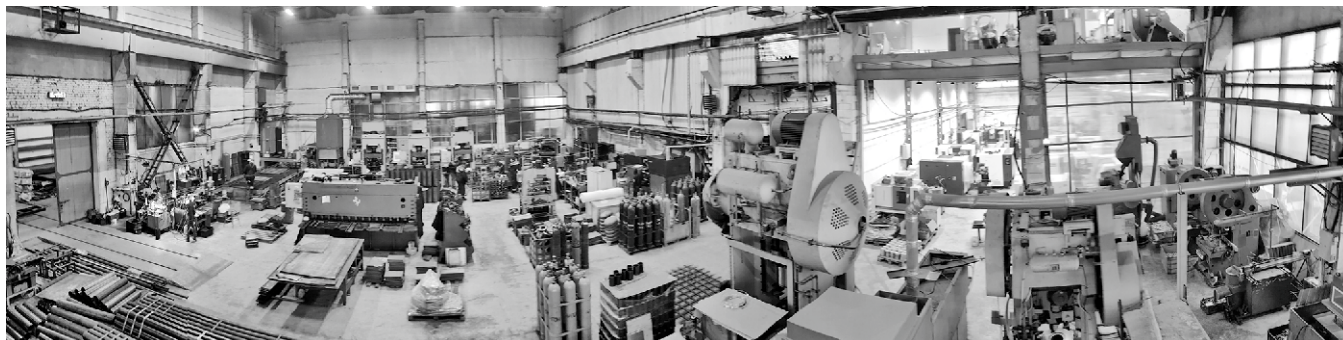
Electronic components



FP® cooling technology is a complete line of refrigeration components for complete refrigeration and air conditioning solutions.

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COMPANY HISTORY

The history of the plant began in 2000, with a small factory for the production of refrigeration receivers. Today the product range consists of more than 300 models of cooling system components. The factory area is 10 000 square meters, the factory has more than 70 people. Frigapoint supplies products to 25 countries in Europe, Asia and America. The quality of products recognized by FP customers around the world and confirmed by the world leader in certification – TÜV Nord.

RANGE OF PRODUCTS

- Electronic oil level regulator FeedWay®;
- Refrigerant receivers, Suction accumulators, Suction accumulators with heat exchanger;
- Oil separators, Oil receivers, Oil filtersы;
- Helical oil separators with receiver;
- Safety valves;
- Differential check valves;
- Rotalock and Diverter valves;
- Ball valves;
- Collapsible filters-driers, Cartridges for filters;
- Electronic expansion valves Evajet®;
- Refrigeration cycle controllers, Compressor rack controller;
- Electronic refrigerant sensor/oil level sensor;
- Pressure sensors, Pressure relays, Cartridge pressure switch;
- Welded vibroeliminators;
- Refillable refrigerant cylinders and special containers;
- Fan speed controller Digifan®;
- Condensing pressure regulator for air conditioners;
- Humidity indicators.

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PRESSURE VESSELS

FP-XX(XX)-XXX,X-XX

connection size
inlet/outlet, inch (mm)

internal volume, dm³

MP series 45 bar (R410A)

LR – vertical refrigerant receiver
LRH – horizontal refrigerant receiver
AS – suction accumulator
AS-HE – suction accumulators with heat exchanger
OS – oil separators
OR – oil receivers
OSR – helical oil separators with receiver
OSF – helical oil separators with flange
CR – refillable refrigerant cylinders and containers

COMPONENTS OF THE OIL RETURN LINE

FP-XXX(XX)-XXX-(XX)

differential pressure, bar

connection size, inch
connection type

MP series 45 bar (R410A)

ERL – electronic oil level regulator
OF – oil filter
DV – dif. check valve
ELS – electronic level sensor
OLS – electronic oil level sensor

LINEAR COMPONENTS

FP-XX-XXX-XXX

connection size, inch

connection size, inch
rotalock connection, inch

VA – vibroeliminator
RV – rotalock valve
SV – safety valve
TV – safety valve
BV – ball valve
SG – humidity indicator
OG – sight glass

FP-SDF(XX)-XXX

connection size,
inch

MP series 45 bar (R410A)

SDF – filter-drier with replaceable core

EVAPORATOR MANAGEMENT SYSTEM AND FAN SPEED CONTROLLERS

FP-MCXXXX

protocol (T – TTL,
M – Modbus RTU)

type of controller (B-base, E-ERV)

quantity of relay output

quantity of analogue input
(in base model)

MC – refrigeration controller

FP-PT-XXX

type of connection
(A – male, B – female)

pressure, bar

PT – pressure sensor
PRL – pressure relay
PRH – pressure relay
PRHL – double pressure relay
PSL – cartridge pressure switches
PSH – cartridge pressure switches

FP-XXX-X

maximum current, amperes

FSR – fan speed controller (3-phase)
CPR1 – fan speed controller (1-phase)
ECRP – condensing pressure regulators
for air conditioners





FP-ERV-X



number of orifice

ERV – electronic expansion valve

REFRIGERANT RECEIVERS

A receiver is a container for storing liquid refrigerant. Receivers are designed to collect liquid after the condenser, create a reserve of refrigerant in the system and uniformly supply refrigerant to the evaporators. The design and technical characteristics of FP receivers allow them to be used for working with any refrigerants, according to permissible operating pressures, except NH₃. Refrigerant receivers are supplied with sight glasses and a nut for the safety valve port (without plug).

Vertical refrigerant receivers										
Type	Model	Ø D, mm	H, mm	A, mm	In/Out	SG ^[1] , M24 pcs	SVP ^[2] , 1¼"	Volume, dm ³	Notes	
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LR(MP)-1,0	102	121	27	3/8" (10 mm) ODS(Cu)	—	—	1,0	Draw. 1 Table 1	
	FP-LR(MP)-1,6	133	139	37	3/8" (10 mm) ODS(Cu)	—	—	1,6		
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LR(MP)-2,5	159	170	—	1/2" (12,7 mm) / 1" – 14 UNS	—	—	2,5	Draw. 2 Table 1	
	FP-LR(MP)-4,0	159	245	—	1/2" (12,7 mm) / 1" – 14 UNS	—	—	4,0		
	FP-LR(MP)-6,3	159	370	—	1/2" (12,7 mm) / 1" – 14 UNS	—	—	6,3		
	FP-LR(MP)-8,0	159	470	—	1/2" (12,7 mm) / 1" – 14 UNS	—	+	8,0		
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LR(MP)-10,0	190	410	130	1" – 14 UNS	—	+	10,0	Draw. 3	
	FP-LR(MP)-12,5	190	515	130	1" – 14 UNS	—	+	12,5		
	FP-LR(MP)-16,0	190	620	130	1" – 14 UNS	—	+	16,0		
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LR(MP)-20,0	240	551	160	1 1/4" – 12 UNF	—	+	20,0	Draw. 4, 6	
	FP-LR(MP)-24,8	240	638	160	1 1/4" – 12 UNF	—	+	24,8		
	FP-LR(MP)-25,0	240	638	160	1 1/4" – 12 UNF	1	+	25,0	Draw. 5, 6	
	FP-LR(MP)-32,5	240	847	160	1 1/4" – 12 UNF	1	+	32,5		
	FP-LR(MP)-40,0	240	964	160	1 1/4" – 12 UNF	2	+	40,0		
	FP-LR(MP)-50,0	325	731	170	1 3/4" – 12 UN	2	+	50,0		
	FP-LR(MP)-63,0	325	876	170	1 3/4" – 12 UN	2	+	63,0		
	FP-LR(MP)-80,0	325	1111	170	1 3/4" – 12 UN	2	+	80,0		
	FP-LR(MP)-100,0	325	1301	170	1 3/4" – 12 UN	3	+	100,0		
	FP-LR(MP)-120,0	325	1551	170	1 3/4" – 12 UN	3	+	120,0		
	FP-LR(MP)-160,0 ^[3]	460	1140	220	2 1/4" – 12 UN	3	+	160,0		
	FP-LR(MP)-200,0 ^[3]	460	1430	220	2 1/4" – 12 UN	3	+	200,0		
	FP-LR(MP)-250,0 ^[3]	460	1590	220	2 1/4" – 12 UN	3	+	250,0		
	FP-LR-300,0 ST	460	2056	250	81 mm ODS(St)	4	+	300,0		
	FP-LR-350,0 ST	460	2356	250	81 mm ODS(St)	4	+	350,0		

Horizontal refrigerant receivers												
Type	Model	Ø D, mm	L, mm	L1, mm	A, mm	A1, mm	H, mm	In/Out	SG ^[1] , 1¼" pcs	SVP ^[2] , 1¼"	Volume, dm ³	Notes
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LRH(MP)-16,0	159	938	850	258	198	219	1" – 14 UNS	—	+	16,0	Draw. 7
	FP-LRH(MP)-25,0	190	982	850	340	280	250	1 1/4" – 12UNF	1	+	25,0	
	FP-LRH(MP)-40,0	240	976	850	365	305	296	1 1/4" – 12UNF	1	+	40,0	
	FP-LRH(MP)-70,0	325	1011	850	365	305	385	1 3/4" – 12UN	1	+	70,0	
 <div> <div>28 bar</div> <div>45 bar</div> </div>	FP-LRH(MP)-100,0	325	1310	750	500	420	375	1 3/4" – 12UN	2	+	100,0	Draw. 8
	FP-LRH(MP)-120,0	325	1560	1000	500	420	375	1 3/4" – 12UN	2	+	120,0	
	FP-LRH(MP)-160,0 ^[3]	460	1165	510	600	520	520	2 1/4" – 12UN	2	+	160,0	
	FP-LRH(MP)-200,0 ^[3]	460	1455	800	600	520	520	2 1/4" – 12UN	2	+	200,0	
	FP-LRH(MP)-250,0 ^[3]	460	1615	960	600	520	520	2 1/4" – 12UN	2	+	250,0	
	FP-LRH-300 ST	460	2025	1060	600	520	578	81 mm ODS(St)	3	+	300,0	Draw. 9
	FP-LRH-350 ST	460	2325	1400	600	520	578	81 mm ODS(St)	3	+	350,0	


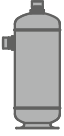
NOTES: SG^[1] – Sight glass, M24×1;
SVP^[2] – Safety valve port, 1¼";



FP-LR – series 28 bar;
FP-LR(MP) – series 45 bar;
FP-LR(MP)-160...250^[3] – series 40 bar;
FP-LRH(MP)-160...250^[3] – series 40 bar.

Cu – Copper connections;
St – Steel connections.

SUCTION ACCUMULATORS

The main task of the liquid separator is to prevent the compressor from running wet. This unit is required not only in all installations with flooded evaporators, but also in installations equipped with overheated evaporators, to prevent the accumulation of refrigerant in the liquid phase in the suction line.





Suction accumulators									
Type	Model	Ø D, mm	H, mm	A, mm	In/Out	Volume, dm ³	Notes		
 <div> <div>Cu-St WELD</div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-AS(MP)-2,0-012	102	319	55	1/2" (12,7 mm) ODS(Cu)	2,0	Draw. 10 Table 1 Table 2 Table 3		
	FP-AS(MP)-2,0-058	102	319	55	5/8" (16,0 mm) ODS(Cu)	2,0			
	FP-AS(MP)-3,5-078	102	520	55	7/8" (22,3 mm) ODS(Cu)	3,5			
	FP-AS(MP)-3,5-118	102	520	55	1 1/8" (28,6 mm) ODS(Cu)	3,5			
	FP-AS(MP)-5,0-118	133	437	70	1 1/8" (28,6 mm) ODS(Cu)	5,0			
	FP-AS(MP)-5,0-138	133	442	70	1 3/8" (35,0 mm) ODS(Cu)	5,0			
	FP-AS(MP)-7,0-138	159	441	90	1 3/8" (35,0 mm) ODS(Cu)	7,0			
	FP-AS(MP)-7,0-158	159	443	90	1 5/8" (42,0 mm) ODS(Cu)	7,0			
 <div> <div>Cu-St WELD</div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-AS(MP)-9,0-158	159	563	90	1 5/8" (42,0 mm) ODS(Cu)	9,0	Draw. 11		
	FP-AS(MP)-12-218	190	546	320	2 1/8" (54,0 mm) ODS(Cu)	12,0			
	FP-AS(MP)-12-258	190	546	320	2 5/8" (67,0 mm) ODS(Cu)	12,0	Draw. 12, 6 Table 1 Table 2 Table 3		
	FP-AS(MP)-25-218	240	680	455	2 1/8" (54,0 mm) ODS(Cu)	25,0			
	FP-AS(MP)-25-258	240	680	455	2 5/8" (67,0 mm) ODS(Cu)	25,0			
	FP-AS(MP)-45-258	325	655	411	2 5/8" (67,0 mm) ODS(Cu)	45,0			
	FP-AS(MP)-45-318	325	655	411	3 1/8" (79,4 mm) ODS(Cu)	45,0			
	FP-AS(MP)-60-114 ST	325	900	608	108 mm (St)	60,0			

Suction accumulators with heat exchanger									
Type	Model	Ø D, mm	H, mm	A, mm	B, mm	In/Out Low pressure ODS(Cu)	In/Out High pressure ^[1] ODS(Cu)	Volume, dm ³	Notes
 <div> <div>Cu-St WELD</div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-AS(MP)-HE-12-218	190	563	338	132	2 1/8" (54,0 mm)	5/8" (16 mm)	12,0	Draw. 13
	FP-AS(MP)-HE-12-258	190	567	338	132	2 5/8" (67,0 mm)	5/8" (16 mm)	12,0	
 <div> <div>Cu-St WELD</div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-AS(MP)-HE-25-218	240	677	455	144	2 1/8" (54,0 mm)	3/4" (19,1 mm)	25,0	Draw. 14 Table 1
	FP-AS(MP)-HE-25-258	240	677	455	144	2 5/8" (67,0 mm)	3/4" (19,1 mm)	25,0	
	FP-AS(MP)-HE-45-258	325	658	414	200	2 5/8" (67,0 mm)	7/8" (22,3 mm)	45,0	
	FP-AS(MP)-HE-45-318	325	658	414	200	3 1/8" (79,4 mm)	7/8" (22,3 mm)	45,0	

NOTES: High pressure^[1] – outer diameter of the inlet/outlet of high-pressure lines;
Cu – Copper connections;
St – Steel connections.


OIL SEPARATORS

Oil separators are designed to separate oil dissolved in the refrigerant in order to return it to the compressor crankcase. FP oil separators are more than 90% efficient, increasing system performance by preventing excess oil circulation.

Oil separators										
Type	Model	Ø D, mm	H, mm	A, mm	B, mm	In/Out ODS(Cu)	ORP ^[1] , inch	Volume, dm ³	OSP ^[2] , liters	Notes
 <div><div>Cu-St WELD</div><div>28bar SERIES</div><div>45bar SERIES</div></div>	FP-OS(MP)-2,0-012	102	319	55	30	1/2" (12,7 mm)	3/8 SAE	2,0	0,5	Draw. 15 Table 1 Chart 1
	FP-OS(MP)-2,0-058	102	319	55	30	5/8" (16,0 mm)	3/8 SAE	2,0	0,5	
	FP-OS(MP)-3,5-078	102	520	55	30	7/8" (22,3 mm)	3/8 SAE	3,5	0,5	
	FP-OS(MP)-3,5-118	102	520	55	30	1 1/8" (28,6 mm)	3/8 SAE	3,5	0,5	
	FP-OS(MP)-5,0-118	133	437	70	40	1 1/8" (28,6 mm)	3/8 SAE	5,0	1,0	
	FP-OS(MP)-5,0-138	133	442	70	40	1 3/8" (35,0 mm)	3/8 SAE	5,0	1,0	
	FP-OS(MP)-7,0-138	159	441	90	45	1 3/8" (35,0 mm)	3/8 SAE	7,0	1,5	
	FP-OS(MP)-7,0-158	159	443	90	45	1 5/8" (42,0 mm)	3/8 SAE	7,0	1,5	
 <div><div>Cu-St WELD</div><div>28bar SERIES</div><div>45bar SERIES</div></div>	FP-OS(MP)-12-218	190	546	145	320	2 1/8" (54,0 mm)	3/8 SAE	12,0	1,8	Draw. 16
	FP-OS(MP)-25-218	240	680	166	455	2 1/8" (54,0 mm)	3/8 SAE	25,0	2,5	Draw. 17, 6 Table 1 Chart 1
	FP-OS(MP)-25-258	240	680	166	455	2 5/8" (67,0 mm)	3/8 SAE	25,0	2,5	
	FP-OS(MP)-45-258	325	655	166	411	2 5/8" (66,7 mm)	3/8 SAE	45,0	2,5	
Helical oil separators with flange										
Type	Model	Ø D, mm	H, mm	A, mm		In/Out ODS(Cu)	ORP ^[1] , inch	Volume, dm ³	OSP ^[2] , liters	Notes
 <div><div>Cu-St WELD</div><div>28bar SERIES</div></div>	FP-OSF-12,0-158	190	543	353		1 5/8" (42 mm)	3/8" SAE	12,0	2,0	Draw. 18 Table 1
	FP-OSF-12,0-218	190	520	353		2 1/8" (54 mm)	3/8" SAE	12,0	2,0	
	FP-OSF-25,0-258	240	735	496		2 5/8" (67 mm)	3/8" SAE	25,0	3,0	Draw. 6, 19 Table 1
	FP-OSF-25,0-318	240	735	493		2 5/8" (67 mm)	3/8" SAE	25,0	3,0	


OIL RECEIVERS

Oil receivers are designed for temporary storage of oil currently unclaimed by the refrigeration system. To monitor the oil level, there are two ports for sight glasses and an SAE port for connecting a differential check valve.

Oil receivers									
Type	Model	Ø D, mm	H, mm	A, mm	In/Out	SG ¹ , M24, pcs	DVP ² , 3/8", SAE	Volume, dm ³	Notes
 <div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-OR(MP)-5,0	102	634	504	1" – 14 UNS	2	+	5,0	Draw. 20 Chart 2
	FP-OR(MP)-8,0	133	650	512	1" – 14 UNS	2	+	8,0	
	FP-OR(MP)-12,0	159	665	520	1" – 14 UNS	2	+	12,0	
	FP-OR(MP)-16,0	190	643	—	1" – 14 UNS	2	+	16,0	Draw. 21 Chart 2
	FP-OR(MP)-25,0	240	670	—	1" – 14 UNS	2	+	25,0	

OIL FILTERS

Oil filters are designed to protect oil circuit elements from foreign particles.

Oil filters						
Type	Model	L, mm	L ₁ , mm	D, mm	Connection A, inch	Notes
 <div> <div>45bar SERIES</div> <div>Cu-St WELD</div> </div>	FP-OF-038	102	46	75	5/8"-18 UNF (3/8" SAE)	Draw. 22 Table 1
	FP-OF-038S	104	46	75	3/8" (10 mm) ODS(Cu)	

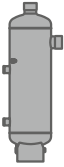
NOTES: ORP^[1] – Oil return port;
OSP^[2] – Oil separator pre-charge;

SG^[3] – Sight glass, M24×1;
DVP^[4] – Diff. valve port, 3/8" SAE.

Cu – Copper connections;
St – Steel connections.


HELICAL OIL SEPARATORS WITH RECEIVER

The main purpose of cyclone oil separators with a built-in oil receiver is to effectively separate oil from the refrigerant, store it and return it to the compressor. These oil separators are designed for high pressure oil return systems of multi-compressor refrigeration units.

Helical oil separators with receiver										
Type	Model	Ø D, mm	Height H, mm	h1, mm	In/Out High pressure	A, mm	B, mm	Volume, dm ³	Oil receiver volume, dm ³	Notes
 <div> <div>Cu-St WELD</div> <div>28bar SERIES</div> <div>45bar SERIES</div> </div>	FP-OSR(MP)-6-034	133	601	495	3/4" (19,1 mm)	60	100	6,0	4,0	Draw. 23 Table 1 Table 4
	FP-OSR(MP)-6-078	133	608	495	7/8" (22,3 mm)	60	100	6,0	4,0	
	FP-OSR(MP)-8-078	159	615	481	7/8" (22,3 mm)	60	100	8,0	5,5	
	FP-OSR(MP)-8-118	159	620	481	1 1/8" (28,6 mm)	60	100	8,0	5,5	
	FP-OSR(MP)-12-138	159	767	621	1 3/8" (35,0 mm)	60	100	12,0	9,0	
	FP-OSR(MP)-12-158	159	768	616	1 5/8" (42,0 mm)	60	100	12,0	9,0	
	FP-OSR(MP)-16-218	190	726	546	2 1/8" (54,0 mm)	90	100	16,0	12,0	Draw. 25 Table 1, 4
	FP-OSR(MP)-40-258	240	1140	910	2 5/8" (67,0 mm)	160	160	40,0	25,0	


OIL SEPARATORS FOR SCREW COMPRESSORS

Cyclone oil separators are designed to separate oil from refrigerant vapor under pressure and return it to the compressor crankcase in systems with oil-injected screw compressors.

Oil separators for screw compressors											
Type	Model	Ø D, mm	H, mm	A, mm	B, mm	ØD2 outer In/Out ODS	ORP ^[1] , inch	SVP ^[2] , 1¼" UNF	Oil receiver volume, dm ³	Volume, dm ³	Notes
 <div><div>28bar</div><div>SERIES</div></div>	FP-OS-40-57 ST	325	700	180	445	57	1 1/4" UNF	+	14,0	40,0	Draw. 6 Draw. 24 Table 5 Chart 1
	FP-OS-80-76 ST	325	1150	178	855	76	1 3/4" UN	+	35,0	80,0	
	FP-OS-200-114 ST	460	1500	266	1126	114	2 1/4" UN	+	80,0	200,0	
	FP-OS-400-114 ST	612	1630	295	1260	114	2 1/4" UN	+	178,0	400,0	
	FP-OS-600-140 ST	716	1790	360	1330	140	67 mm ODS(St)	+	278,0	600,0	

REFILLABLE REFRIGERANT CYLINDERS

Designed for storage and transportation of CFCs, HCFCs and HFCs. The cylinders are equipped with a shut-off valve with a safety device and a passport; they comply with all standards of TR TS032/2013.

Refillable refrigerant cylinders									
Type	Model	Ø D, mm	H, mm	Ød, mm	Out, inch	Weight of refrigerant R22, kg	Volume, dm ³	Working press, MPa	Notes
 <div>35bar SERIES</div>	FP-CR-15	240	475	220	1×7/16"-20 UNF (1/4 SAE)	12,4	12,5	3,5	Draw. 26 Table 6
	FP-CR-15Y	240	475	220	2×7/16"-20 UNF (1/4 SAE)	12,4	12,5	3,5	
	FP-CR-30Y	240	825	220	2×7/16"-20 UNF (1/4 SAE)	29,8	30,0	3,5	
	FP-CR-60Y	325	1005	260	2×7/16"-20 UNF (1/4 SAE)	59,5	60,0	3,5	

The period of technical examination of reusable freon cylinders and containers is 5 years.

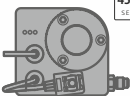
NOTES: ORP^[1] – Oil return port;
SVP^[2] – Safety valve port, 1¼"

FEEDWAY. ELECTRONIC OIL LEVEL REGULATORS

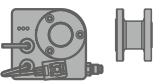
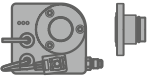

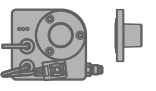
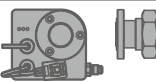
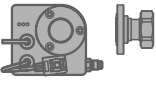
The Feedway electronic oil level regulator is designed for installation in the oil circuit of compressor stations for the purpose of monitoring, maintaining the oil level in the compressor crankcase, emergency notification and shutdown of the compressor in case of low oil level in the crankcase.

The design of the electronic regulator is based on the electronic-mechanical principle of operation using a "Hall sensor" as a sensitive element, which avoids false alarms and effectively controls the oil level in the compressor.

FeedWay. Electronic oil level regulators


Type	Model	Parameter	Value	Notes
 FEEDWAY OIL LEVEL CONTROL	FP-ERL4	Max. operating pressure	4,5 MPa	Draw. 27, 29
		Test pressure	5,0 MPa	
		Power supply	230 V; 50/60 Hz; 0,04 A	
		Range of filling	40...60% from sight glass height	
		Protection class	IP67	
		Time fill delay	10 sec	
		Alarm relay delay	120 sec	
		Alarm relay	max 3 A; 230 V; 50/60 Hz	
		Length of cables of power supply / alarm relay	3 m. 1 integrated cable	
		Oil connection	Thread 7/16"-20UNF external (1/4"SAE)	



FeedWay. Adapters


Type	Model	Manufacturer – Type of compressor	Notes
	FP-ERL4+UA Flange adapter 3 holes Ø 6.7 mm, D 47.6 mm 4 holes Ø 6.7 mm, D 50.0 mm	Copeland: D2, D3, D4, D6, D9, 4CC, 6CC, ZBH, 4M, 6M Bitzer: 4VC, 4TC, 4PC, 4NC, 4J, 4H, 4G, 6J, 6H, 6G, 6F, 8GC, 8FC, 4VHC-10K, 4THC-12K, 4PHC-15K, 4NHC-20K, 4VS-15K...4NSL-30K, 4VES-8F Dorin: all K, KP (except as indicated below) SCC 500B, 750B, 1500B, 1900B, 2000B, 2500B, H41, H5, H6, H7, SCC_1, SCC_32, SCC_4, CDSW_35, CDS_41 Frascold: A, B, D, F, S, V, Z Series A-SK, D-SK, F-SK, Q-SK, S-SK Bock: HA, HG, O-Serie, HGX4/310-4, 385-4, 464-4, 555-4 (CO ₂) Carrier: 06E Arctic Circle: G2, G4, G6	Draw. 31
	FP-ERL4 + BBL Thread adapter 1 1/8"-18UNEF, flange and 2 O-rings included	Bitzer: entire series 2...C; 4FC, 4EC, 4DC, 4CC2KHC, 4FHC, 4EHC, 4DHC, 4CHC, 2MSL-07K...4CSL-12K, 2KES – 4BES Dorin: H11, H2, H32, H35, K100CC/CS, K150CC/CS, K180CC/CS, K200CC, K230CS, K235CC, K240SB, K40CC, K50CS, K75CC/CS- SCC 250B, 300B, 350B, 380B, CDS_11 Bock: HA12/22/34, HG12/22/34 HGX12P/40-4, 50-4, 60-4, 75-4 (CO ₂) HGX22P110-4, HGX22P125-4, HGX22P/160-4, HGX22P/190-4 (CO ₂), HGX34P/215-4, HGX34P/255-4 (CO ₂) Tecumseh: TAG Maneurop: LT; MT; NTZ; SM; SZ Danfoss: LFZ, MFZ, MLM, MT, SM, SZ, LT Dorin: H11, H2, H32, H35, K100CC/CS, K150CC/CS, K180CC/CS, K200CC, K230CS, K235CC, K240SB, K40CC, K50CS, K75CC/CS- SCC 250B, 300B, 350B, 380B, CDS_11 Bock: HA/HG 22/34 RefComp: SP2L, SP2H	Draw. 32
	FP-ERL4+BBL+MLZ	Danfoss: LLZ; MLZ	
	FP-ERL4+AA Thread adapter 3/4"-14NPTF, flange and 1 O-ring included	Copeland: ZF06 – ZF18, ZS21-45, ZB 21-45 production until 06.2014 Bitzer: ZL, ZM Bristol: H29, H2, H7, H79 InvoTech: YSM, YSH	Draw. 33
	FP-ERL4 + CD Rotalock adapter 1 3/4"-12UNF	Copeland: ZR 90 - ZR 19, ZR 250 - ZR 380, ZB 56 - ZB 11M, ZS 56 - ZS 11M, ZF 24 - 48 ZH, ZB 220	Draw. 34
	FP-ERL4 + CE Rotalock adapter 1 1/4"-12UNF (free flange)	Copeland: Summit:ZR 94-ZR190 ZB 50, ZB 58-ZB 114, ZF-25 - ZF49, ZB 15-45 , ZF06 - ZF18 production since 06.2014, ZBD, ZFD. FP: FP-SH, FP-SL, FP-SM InvoTech: YM, YF, YH230-355	Draw. 35

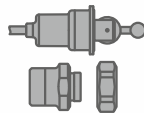
ELECTRONIC REFRIGERANT SENSOR/OIL LEVEL SENSOR


Electronic level sensors FP-ELS2/OLS2 are intended for use as an electronic meter of limit values of levels (interfaces) of working media in capacitive equipment - vessels, compressors, flooded evaporators, circulation receivers and pressure vessels. To be installed on the connecting ports of visual level (interface) monitoring devices.

Electronic refrigerant sensor/oil level sensor					
Type	Model	Parameter	ELS2	OLS2	Notes
	FP-ELS2	Max. operating pressure	4,5 MPa	4,5 MPa	Draw. 28, 30
	FP-OLS2	Test pressure	5,0 MPa	5,0 MPa	
		Power supply	230 V; 50/60 Hz; 0,04 A	230 V; 50/60 Hz; 0,04 A	
		Protection class	IP67	IP67	
		Alarm relay delay	20 sec	120 sec	
		Alarm relay	max. 3 A; 230 V; 50/60 Hz	max. 3 A; 230 V; 50/60 Hz	
		Length of cables of power supply	3 m. 1 integrated cable	2 m. 1 integrated cable	
		Emergency level	40%	25%	
		Recommended control environment	refrigerants	oil	

Electronic refrigerant sensor/oil level sensor. Adapters			
Type	Model	Manufacturer – Type of compressor	Notes
	FP-ELS2/OLS2 + FA M24 thread adapter, flange and two O-rings included	Refrigerant receiver series FP-LR, FP-LRH, FP-OR after 01.2019. Oil separators FP-OS until 01.2023. For a list of adapters for installing FP-OLS2 on a compressor, see page 8.	Draw. 36
	FP-ELS2/OLS2 + CE Rotalock adapter 1 1/4"-12UNF (loose flange)	Refrigerant receivers of the FP-LR, FP-LRH, FP-OR and FP-OS series until 01.2019. For a list of adapters for installing FP-OLS2 on a compressor, see page 8.	Draw. 35


Electronic refrigerant sensor/oil level sensor				
Type	Model	Parameter	Value	Notes
	FP-ELS-L	Max. operating pressure PS	4.5 MPa	Draw. 37
		Test pressure PT	5.0 MPa	
		Burst pressure	20.0 MPa	
		Power supply	15...30 V DC	
		Energy consumption	1 VA	
		Ambient / storage temperature	-40...+50 °C	
		Working environment temperature	-40...+80 °C	
		Protection class	IP65	
		Alarm relay contacts	max 1 A 30 V DC (30 W); 0.25 A 250 V AC	
		Electrical connection	Cable PVC 5x0.25 (AWG23)	
		Power cable length	2 m	

Electronic refrigerant sensor/oil level sensor. Adapters			
Type	Model	Description	Notes
	FP-ELS-L + M24-114 (L) Thread adapter M24 - 1 1/4", gasket and nut included	The adapter is required when installing on refrigerant receivers of the FP-LR, FP-LRH, FP-OR series after 01.2019 and FP-OS oil separators before 01.2023. In all other cases, the sensor is mounted without an adapter.	Draw. 38

Power supply for electronic level sensors					
Type	Model	Input voltage	Output voltage	Power	Notes
	FP-PSU-1-24	180...242 V, 50/60 Hz	18...30 V DC	1 W	Draw. 39



SAFETY VALVES

A safety valve must be installed on all vessels that have a safety valve port. It is designed to protect pressure vessels from unacceptable excess pressure by releasing excess working fluid.

Safety valves							
Type	Model	Connection		Nominal pressure, MPa	Setting pressure, MPa	Max. vessel volume, dm ³	Notes
		Ø d, inch	Ø D, SAE, inch				
	FP-SV-038	3/8" NPT	5/8"-18UNF (3/8 SAE)	2,8	3,0	250	Draw. 40
	FP-SV(MP)-038	3/8" NPT	5/8"-18UNF (3/8 SAE)	4,5	4,8	110	


ADAPTERS FOR SAFETY VALVES AND LEVEL SENSORS

The adapter is used to connect a 1 1/4" threaded safety valve port to a 1/2" or 3/8" female tapered safety valve port.

Adapters for safety valves and level sensors				
Type	Model	Connection, inch	Description	Notes
	Adapter FP-A-012 (1/2")	1/2" NPT	Adapter for mounting a valve with 1/2" NPT thread on an FP vessel	Draw. 41
	Adapter FP-A-038 (3/8")	3/8" NPT	Adapter for mounting a valve with 3/8" NPT thread on an FP vessel	
	Adapter FP-A-038-012	1/2" – 3/8" NPT	Adapter for mounting the FP-SV and FP-SV(MP) valve on a vessel with SVP 1/2" NPT	Draw. 42


DIFFERENTIAL CHECK VALVE


The FP-DV differential check valve is designed to maintain the pressure difference in the oil circuit in low pressure systems. The valve is installed on the oil return line between the oil receiver and the suction line.

Differential check valve				
Type	Model	Connection, inch	Pressure difference, bar	Notes
	FP-DV-038-35	5/8"-18UNF (3/8 SAE)	3,5	Draw. 43

HEATING KIT FOR CYCLONE OIL SEPARATOR


The devices are designed to heat oil in cyclone oil separators. Supplied as a ready-made heating kit for OS-40, OS-80, OS-200. Does not come with sleeves. The liners are installed in cyclone oil separators.

Heaters					
Type	Model	Length, mm	Voltage, V	Power, W	Notes
	FP-TEH-120-150W	120	~230	150	Draw.44 Table 5

Thermostats					
Type	Model	Temperature, °C	Voltage, V	Load, A	Notes
	FP-TS-90	6...90	~230	10 (2,5)	Draw. 45 Table 5


STANDS FOR RECEIVERS

Stands for receivers are used for vessels with a diameter of 190 mm; if necessary, install them on a support platform (profile pipe) - vertical receivers FP-LR-10.0; 12.5; 16.0; liquid separators FP-AS-12 and oil separators FP-OS-12.

Stands for receiver						
Type	Model	Length, mm	Width, mm	Height, mm	Protrusion length, mm	Notes
	FP-ST-LR-D190	224	70	30	150	Draw. 46


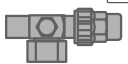
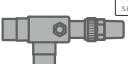
STANDS FOR HORIZONTAL RECEIVERS

Stands for horizontal receivers are used to install the compressor on horizontal receivers FP-ST-LRH-16, FP-ST-LRH-25, FP-ST-LRH-40, FP-ST-LRH-70.

Stands for horizontal receivers									
Type	Model	Dimensions			Mounting dimensions			Compressor Models	Notes
		L, mm	B, mm	H, mm	l1, mm	b1, mm	b2, mm		
	FP-ST-LRH-16	800	270	42	736	—	198	Bitzer: 2EES-2(Y)...2CES-4(Y), 2KES-05(Y)...2FES-3(Y), 4FES-3(Y)...4CES-9(Y) Dorin: H11, H35 Frascold: A, B, D	Draw. 47
	FP-ST-LRH-25	800	352	42	736	—	280	Bitzer: 2EES-2(Y)...2CES-4(Y), 2KES-05(Y)...2FES-3(Y), 4FES-3(Y)...4CES-9(Y), 4VES-6Y...4NE-20(Y) Dorin: H2, H11, H33, H35, H41 Frascold: A, B, D, S, Q	
	FP-ST-LRH-40-70	800	384	42	736	220	305	Bitzer: 2KES-05(Y)...2FES-3(Y), 2EES-2(Y)...2CES-4(Y), 4FES-3(Y)...4CES-9(Y), VES-6Y...4NE-20(Y), EJE-13Y...4FE-35(Y) Dorin: H2, H5, H11, H33, H35, H41 Frascold: A, B, D, Q, S, V	

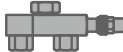
ROTALOCK VALVES

The Rotalock valve is designed to lock and shut off devices (compressors, receivers), which allows for timely maintenance and facilitates equipment replacement. Two 1/4" SAE service ports are designed for connecting instrumentation and automation equipment.

Rotalock valves						
Type	Model	Connection		L, mm	□, mm	Notes
		Ø D, inch	Ø d, inch			
	FP-RV-014 SAE (FP-ERL)	7/16" – 20UNF (1/4" SAE)	7/16" – 20UNF (1/4" SAE)	72	—	Draw. 48
	FP-RV-038 SAE (FP-DV)	5/8" – 18UNF (3/8 SAE)	5/8" – 18UNF (3/8 SAE)	72	—	
	FP-RV-034-012	3/4" UN	1/2" ODS	106	SW 20	Draw. 49
	FP-RV-1-038	1" – 14 UNS	3/8" ODS	106	SW 20	
	FP-RV-1-012	1" – 14 UNS	1/2" ODS	106	SW 20	
	FP-RV-1-058	1" – 14 UNS	5/8" ODS	106	SW 20	
	FP-RV-114-058	1 1/4" – 12 UNF	5/8" ODS	109	SW 22	
	FP-RV-114-034	1 1/4" – 12 UNF	3/4" ODS	142	SW 30	
	FP-RV-114-078	1 1/4" – 12 UNF	7/8" ODS	142	SW 30	
	FP-RV-114-118	1 1/4" – 12 UNF	1 1/8" ODS	145	SW 30	
	FP-RV-134-078	1 3/4" – 12 UN	7/8" ODS	142	SW 30	
	FP-RV-134-118	1 3/4" – 12 UN	1 1/8" ODS	185	SW 36	
	FP-RV-134-138	1 3/4" – 12 UN	1 3/8" ODS	187	SW 36	
	FP-RV-134-158	1 3/4" – 12 UN	1 5/8" ODS	191	SW 36	
	FP-RV-214-138	2 1/4" – 12 UN	1 3/8" ODS	201	SW 50	
	FP-RV-214-158	2 1/4" – 12 UN	1 5/8" ODS	203	SW 50	
	FP-RV-214-218	2 1/4" – 12 UN	2 1/8" ODS	205	SW 50	
	FP-RV-318-318 for LR(H)-300/350 ST	3 1/8" ODS	3 1/8" ODS	288	SW 100	Draw. 50


TEE VALVES

Diverter valves FP-TV are designed for installation on SVP pressure vessels. The diverter valve has two connection ports for connecting safety devices. The use of changeover valves allows one of the safety devices to be dismantled for verification and calibration (after operation) without shutting down the entire refrigeration system.

Tee valves						
Type	Model	Ø D, inch	Ø d, inch	L, mm	□, mm	Notes
 45 bar	FP-TV-114-038	1 1/4" – 12 UNF	3/8" NPT	147	SW22	Draw. 51



BALL VALVES

The ball valve FP-BV is designed for shutting off and isolating the devices of the refrigeration circuit, which allows for timely service and facilitates the replacement of equipment in the suction, discharge and liquid lines. Ball valves ensure tight closure. All valves are tested for strength and tightness.

Ball valves						
Type	Model	Ø D, mm	Ø d, inch	L, mm	H, mm	Notes
	FP-BV-014	30	1/4" (6,35 mm)	128	52,0	Draw. 52 Table 1
	FP-BV-038	30	3/8" (10,00 mm)	128	52,0	
	FP-BV-012	30	1/2" (12,70 mm)	128	52,0	
	FP-BV-058	30	5/8" (16,00 mm)	138	52,0	
	FP-BV-034	41	3/4" (19,10 mm)	156	68,0	
	FP-BV-078	41	7/8" (22,30 mm)	156	68,0	
	FP-BV-118	76	1 1/8" (28,60 mm)	225	109,0	
	FP-BV-138	76	1 3/8" (35,00 mm)	235	109,0	
	FP-BV-158	76	1 5/8" (42,00 mm)	235	109,0	
	FP-BV-218	96	2 1/8" (54,00 mm)	269	134,0	
	FP-BV-258	96	2 5/8" (67,00 mm)	299	134,0	
	FP-BV-318	116	3 1/8" (79,40 mm)	326	154,0	


HUMIDITY INDICATORS

The FP-SG humidity indicator is designed for visual monitoring of the condition of the refrigerant in the liquid lines of refrigeration units. The main function of the humidity indicator is to indicate the moisture content of the refrigerant, which allows you to monitor the drying capacity of the dryer filter. The color of the indicator changes from green ("dry") to yellow ("wet") depending on the amount of moisture in the refrigerant.

Humidity indicators									
Type	Model	L, mm	L _i , mm	H, mm	H _i , mm	øD, mm	ød, mm	Connection dimensions, inch	Notes
 45 bar	FP-OG-038	82	–	28	14	27	–	5/8" 18 UNF (3/8" SAE)	Draw. 53 Table 7
	FP-SG-038	119	9	24	14	27	9,53	3/8" (10 mm) ODS (Cu)	Draw. 54 Table 1, 7
	FP-SG-012	146	10	29	17	27	12,7	1/2" (12,7 mm) ODS (Cu)	
	FP-SG-058	146	12	31	19	27	15,9	5/8" (16 mm) ODS (Cu)	
	FP-SG-078	173	14	38	22	32	22,3	7/8" (22 mm) ODS (Cu)	



WELDED VIBROELIMINATORS

Vibroeliminators are designed for installation in stationary and mobile cooling systems. Thanks to Cu-St FP weld technology, vibration damper connections are heat-resistant and durable.

Welded vibroeliminators							
Type	Model	Overall dimensions			Connection	Max. operating pressure, MPa	Notes
		L, mm	Ø D, mm	l, mm	Ød ODS, inch		
	FP-VA-038	230	23,5	23	3/8" (10,0 mm)	4,5	Draw. 55 Table 1
	FP-YVA-012	205	23,5	23	1/2" (12,7 mm)	4,5	
	FP-YVA-058	218	29	17	5/8" (16,0 mm)	4,5	
	FP-VA-034	255	29	17	3/4" (19,1 mm)	4,5	
	FP-YVA-078	242	34	20	7/8" (22,3 mm)	4,5	
	FP-YVA-118	281	40	21	1 1/8" (28,6 mm)	4,5	
	FP-VA-138	375	48	25	1 3/8" (35,0 mm)	4,5	
	FP-VA-158	430	57	27	1 5/8" (42,0 mm)	4,5	
	FP-VA-218	510	67	33	2 1/8" (54,0 mm)	4,0	
	FP-VA-258	690	85	35	2 5/8" (67,0 mm)	3,5	
	FP-VA-318	690	105	35	3 1/8" (79,4 mm)	3,0	


PRESSURE SWITCHES

FP-PR pressure switches are designed for use in refrigeration and air conditioning systems to protect against too low suction pressure or too high discharge pressure. Pressure switches are also used to start and stop refrigeration compressors.

Pressure switches / Dual pressure switch								
Type	Model	Low pressure (LP)		High pressure (HP)		Reset	Max. working pressure, bar	Notes
		Regulation range, bar	Differential Δp, bar	Regulation range, bar	Differential Δp, bar			
	FP-PRL-06M	-0,5 ... 6,0	0,6 ... 4,0			Manual	17,0	Draw. 56
	FP-PRL-06A	-0,5 ... 6,0	0,6 ... 4,0			Automatic	17,0	
	FP-PRH-30M			8 ... 30	3 ... 10	Manual	35,0	
	FP-PRH-30A			8 ... 30	3 ... 10	Automatic	35,0	
	FP-PRH-42A			8 ... 42	4 ... 10	Automatic	45,0	
	FP-PRHL-32A	-0,2 ... 7,5	0,7 ... 4,0	8 ... 32	4	Automatic	35,0	Draw. 57

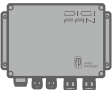

CARTRIDGE PRESSURE SWITCH

Fixed set point diaphragm type cartridge pressure switches FP-PS are designed for use in refrigeration and air conditioning systems with CFC, HCFC and HFC refrigerants as high and low pressure safety switches.



Cartridge pressure switch					
Type	Model	Response pressure		Max. working pressure (MWP), bar	Notes
		Off, bar	On, bar		
	FP-PSL-1,7	1,7	2,7	15	Draw. 58
	FP-PSH-28	28,0	21,0	45	

DIGIFAN. FAN SPEED CONTROLLERS (3-PHASE)

Fan speed controllers FP-FSR-8 and FP-CPR1-4 are designed for installation on refrigeration units in order to maintain a given level of condensation pressure in the system by changing the rotation speed of the condenser fans by regulating the voltage. FSR-8 is a slave device, control occurs on the master device. CPR1- is a stand-alone device.

Fan speed controller (3-phase)				
Type	Model	Parameter	Value	Notes
 	FP-FSR-8	Voltage	~400 V $\pm 10\%$, 50/60 Hz with automatic synchronization	Draw. 62, 63, 64
		Output voltage range	25...99 % of supply voltage	
		Maximum connected power	5.5 kVA	
		Rated current	8 A	
		Minimum current	0.2 A	
		Maximum current*	12 A	
		Dissipation power	30 W	
		Analog inputs	0...10 V – 1 pcs, 4...20 mA – 1 pcs	
		Digital inputs	2 pcs, Dry contact	
		Output relay	Max 1 A, 250 VAC; 3 A, 30 VDC	
		Protection class	IP55	



* Ambient temperature - no more than +50 °C
maximum duration - no more than 10 seconds every 5 minutes.

Fan speed controller (1-phase)				
Type	Model	Parameter	Value	Notes
 	FP-CPR1-4	Voltage	~230 V $\pm 10\%$, 50/60 Hz with automatic synchronization	Draw. 65, 66, 67
		Output voltage range	25...99 % of supply voltage	
		Maximum working pressure	4,5 MPa	
		Rated current	4 (3) A*	
		Minimum current	0.2 A	
		Setting range	5...35 bar (factory setting 20 bar)	
		Cable	PVC, 4x0.75 (Ø 5.9 mm, length 1 m)	
		Controlled Environments	HCFCs, HFCs and other group 2 refrigerants	
		Operating ambient temperature	-25...55 °C	
		Working environment temperature	-25...70 °C	
		Protection class	IP67	

*) 4.0 A at $t \leq 40^\circ\text{C}$; 3.0 A at $t 40...55^\circ\text{C}$

DIGIFAN. CONDENSING PRESSURE REGULATORS FOR AIR CONDITIONERS


The condensation pressure regulator in air conditioning systems FP-ECPR-2 is included in the winter kit and is designed to maintain a certain level of condensation pressure in split air conditioning systems. It is used mainly in split systems that operate in a wide range of outdoor temperatures. FP-ECPR-2 ensures reliable operation of the air conditioner during cold weather in winter by changing the condenser fan rotation speed in the range from 0 to 100 percent.

Condensing pressure regulators for air conditioners				
Type	Model	Parameter	Value	Notes
 	FP-ECPR-2	Supply voltage	~230 V $\pm 10\%$, 50/60 Hz with automatic synchronization	Draw. 68, 69
		Output voltage range	25...99 % from supply voltage	
		Maximum load current	2 A	
		Ambient operating temperature	-40...60 °C	
		Protection class	IP55	

FILTER-DRIERS WITH REPLACEABLE CORE

The FP-SDF filter-drier housing is designed for cartridge installation in order to protect refrigeration and air conditioning systems from solid particles, moisture and acid. The filter drier is usually installed in the liquid line before the expansion valve or in the suction line before the compressor. The filter-drier housing is completed with a cartridge holder and is not completed with a cartridge.

Filter-driers with replaceable core



Type	Model	Connection Ød ODS, inch	Overall dimensions		Number of cores	H ₁ , mm	Notes
			L, mm	L ₁ , mm			
 <div> <div>Cu-St WELD</div> <div>45bar SERIES</div> <div>28bar SERIES</div> </div>	FP-SDF(MP)-058	5/8" ODS(Cu) (16,0 mm)	216	144	1	84	Draw. 59 Table 1
	FP-SDF(MP)-078	7/8" ODS(Cu) (22,3 mm)	224	152	1	84	
	FP-SDF(MP)-118	1 1/8" ODS(Cu) (28,6 mm)	226	154	1	93	
	FP-SDF(MP)-138	1 3/8" ODS(Cu) (35,0 mm)	232	161	1	96	
	FP-SDF(MP)-158	1 5/8" ODS(Cu) (42,0 mm)	240	168	1	96	
	FP-SDF(MP)-218	2 1/8" ODS(Cu) (54,0 mm)	255	160	1	103	
	FP-SDF(MP)-258	2 5/8" ODS(Cu) (67,0 mm)	260	173	1	110	
	FP-SDF(MP)-2-078	7/8" ODS(Cu) (22,3 mm)	377	297	2	90,5	
	FP-SDF(MP)-2-118	1 1/8" ODS(Cu) (28,6 mm)	380	300	2	92	
	FP-SDF(MP)-2-138	1 3/8" ODS(Cu) (35,0 mm)	386	306	2	96	
	FP-SDF(MP)-2-158	1 5/8" ODS(Cu) (42,0 mm)	393	313	2	96	
	FP-SDF(MP)-2-218	2 1/8" ODS(Cu) (54,0 mm)	403	303	2	103	
	FP-SDF(MP)-2-258	2 5/8" ODS(Cu) (67,0 mm)	413	313	2	109	
	FP-SDF(MP)-3-138	1 3/8" ODS(Cu) (35,0 mm)	537	457	3	96	
	FP-SDF(MP)-3-158	1 5/8" ODS(Cu) (42,0 mm)	538	458	3	96	
	FP-SDF(MP)-3-218	2 1/8" ODS(Cu) (54,0 mm)	548	448	3	103	
	FP-SDF(MP)-3-258	2 5/8" ODS(Cu) (67,0 mm)	558	458	3	109	

The thickness of the FP-SDF cover is 8 mm; FP-SDF(MP) - 12 mm.

CARTRIDGES FOR FILTERS



Cartridges for collapsible filters are designed to protect the system from mechanical contamination (48F), moisture (48DM) and acid (48DC, 48DA). Depending on their purpose, filters have different ratios of drying component (molecular sieve) and anti-acid component (activated aluminum).

Cartridges for filters

Type	Model	Material	Overall dimensions			Notes
			L, mm	D, mm	d, mm	
	FP-48DM (Moisture removal)	100% molecular sieve	138	95	44	Draw. 60
	FP-48DC (Moisture and acid remove)	80% molecular sieve 20% activated aluminum	138	95	44	
	FP-48DA (Acid remove)	30% molecular sieve 70% activated aluminum	138	95	44	
	FP-48F (Dirt protection)	filter. paper	138	95	64	Draw. 61



EVAJET. REFRIGERATION CYCLE CONTROLLER


The FP-MC-R23EM refrigeration cycle controller is designed to control the compressor, evaporator fan, defrost and electronic control valve (ERV) of the system using 4 analog sensors (3 temperature sensors and 1 programmable temperature/pressure sensor) and 1 dry contact signal.

Evajet. Refrigeration cycle controller				
Type	Model	Parameter	Value	Notes
 	FP-MC-R23EM	Supply voltage	~230 V \pm 10%; 50/60 Hz	Draw. 70
		Dimension	Overall dimension 77×35,5×79(65,5) mm Panel 77×35,5 mm	
		Interface	RS485 Modbus RTU	
		Environment	-5...+55 °C, relative humidity 10...90%	
		Protection class	IP65 front panel, IP20 case	
		Analogue inputs	FP-TSN(PX3-42H) range -45...+110 °C — 4 pcs; 4...20 mA — 1 pcs	
		DIN	Dry contact, configured	
		Relay output C, F, D	Inductive load (AC15) 250 V/3 A, (DC13) 30 V/3 A Resistive load (AC1) 250 V/8 A, (DC1) 30 V/8 A	
		ERV	Triac (AC15) 10...230 V/1 A	
		Connection	Connection till 1,5 mm ²	
		Set	Controller, mounts, temperature sensor — 3 pcs	

EVAJET. COMPRESSOR RACK CONTROLLERS

The rack controller is a compact solution for controlling multi-compressor centrals and a condenser; it has 8 freely configurable inputs/outputs; control of the actuator is possible using step and smooth algorithms.

Evajet. Compressor rack controller				
Type	Model	Parameter	Value	Notes
 	FP-MC-CR8220LM	Supply voltage	~230 V \pm 10%; 50/60 Hz	Draw. 71
		Energy consumptio	3 W	
		Dimensions	Mounting hole 71×29 mm Panel 77×35,5 mm Overall 77×35,5×79(65,5) mm	
		Protection class	IP65 front panel, IP20 back	
		Terms of Use	-5...+50 °C, relative humidity 90%	
		Analog inputs	4...20 mA — 2 pcs	
		Analogue outputs	0...20 mA — 1 pcs, 0...10 V — 1 pcs	
		Digital inputs	Dry contact — 11 pcs	
		Digital outputs	Triac (AC15) 10...230 V/1 A — 8 pcs Alarm relay (AC15) 250V/3A — 1 pcs	
		Serial port	RS-485 Modbus RTU	
		Electrical connections	Detachable screw terminals up to 1,5 mm ²	

Temperature sensors								
Type	Model	Temperature range, °C	Accuracy, %	Protection class	Nominal resistance at 25 °C	Type	Wire length	Notes
	FP-TST-NTC-20	-45 ... 110	1	IP65	10 k	NTC 10k	2 m	—
	FP-TST-PTC-10	-45 ... 110	1	IP65	1 k	PTC 1k	1 m	

EVAJET. PRESSURE SENSORS

Pressure sensors FP-PT are designed for installation on the discharge side and suction side of the refrigeration circuit in order to measure excess pressure. The pressure sensors are compatible with all types of refrigerants and have high vibration and shock resistance. The sensor body is made of brass and is not subject to corrosion.

Evajet. Pressure sensors						
Type	Model	Measuring range, bar	Connection	Output signal, mA	Power supply direct current, V	Notes
	FP-PT-10A (W)	-0,5...10	7/16-20UNF (A) (1/4 SAE) M 2 m integrated cable	4...20	8...25	Draw. 72
	FP-PT-35A (W)	0...35		4...20	8...25	
	FP-PT-45A (W)	0...45		4...20	8...25	
	FP-PT-10B (W)	-0,5...10	7/16-20UNF (B) (1/4 SAE) F 2 m integrated cable	4...20	8...25	Draw. 73
	FP-PT-35B (W)	0...35		4...20	8...25	
	FP-PT-45B (W)	0...45		4...20	8...25	

EVAJET. ELECTRONIC EXPANSION VALVES

Electronic expansion valves FP-ERV are electronically controlled valves designed for use in refrigeration and air conditioning systems. The valve is controlled using the refrigeration system controller FP-MC-23EM. The valve capacity ranges from 0.36 to 16.3 kW (R404) and can be changed by replacing the nozzles (FP-ERV-1 to FP-ERV-8).

Evajet. Electronic expansion valves				
Type	Model	Parameter	Value	Notes
	FP-ERV	Voltage	220 V, ±10%	Draw. 74
		Protection class	IP 67	
		Operating principle	PWM	
		Recommend period	6 sec	
		Capacity (R22)	ERV: 0,36...16,3 kW	
		Capacity range	10...100 %	
		Working temperature	-50...+50 °C	
		Plunger sealing leakage	<0,02 % from kv-value	
		Maximum operating pressure	45 bar	

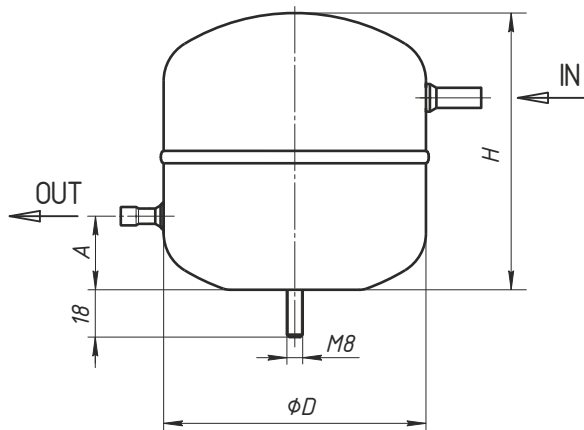
Rated capacity of electronic expansion valves FP-ERV									
Type	Nominal capacity*, kW						kv-value, m³/h	MOPD**, bar	
	R22	R134a	R404A/R507	R407C	R410A	R744		20 W	25 W
ERV-1	0,36	0,32	0,29	0,39	0,46	0,42	0,003	60	60
ERV-2	1,0	0,9	0,8	1,1	1,3	1,3	0,010	51	60
ERV-3	1,6	1,4	1,3	1,7	2,0	2,1	0,017	36	48
ERV-4	2,6	2,1	2,0	2,5	3,2	3,4	0,025	31	41
ERV-5	4,1	3,4	3,1	4,0	5,1	5,3	0,046	24	31
ERV-6	6,4	5,3	4,9	6,4	8,0	8,3	0,064	23	28
ERV-7	10,2	8,5	7,8	10,1	12,7	13,2	0,114	22	27
ERV-8	16,3	13,5	12,5	17,0	20,2	21,0	0,162	16	19

* Capacities are specified under the following conditions: condensing temperature $t_c=32$ °C, liquid temperature before ERV $t_l=28$ °C, evaporation temperature $t_e=5$ °C. The selection of ERV for design conditions is recommended to be carried out in the VesSel online servicelocated at <http://frigopoint.com/ru/vessel/online>

** Maximum operating differential pressure for the specified coil power (at AC230 50Hz supply voltage)

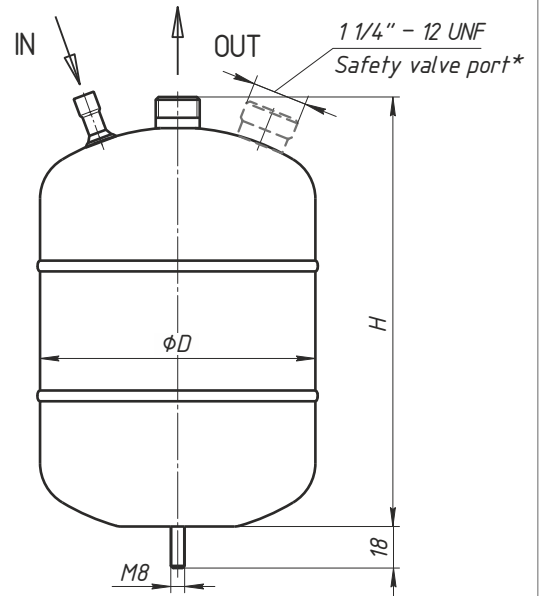
Drawing 1.

Vertical receivers FP-LR-1,0; FP-LR-1,6. Page 4



Drawing 2.

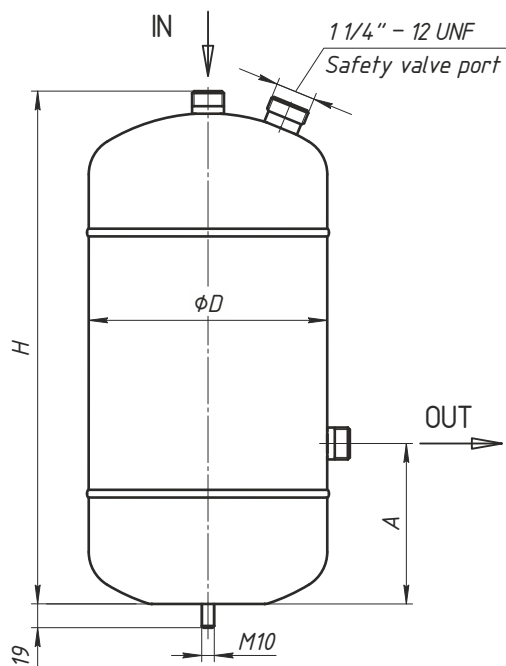
Vertical receivers FP-LR-2,5...8,0. Page 4



* Model FP-LR-2,5...6,3 without safety valve port
Model FP-LR-8,0 with safety valve port

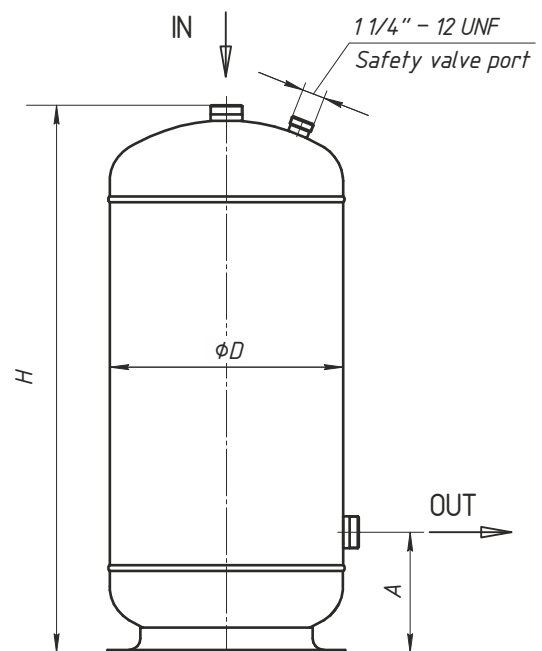
Drawing 3.

Vertical receivers FP-LR-10,0...16,0. Page 4



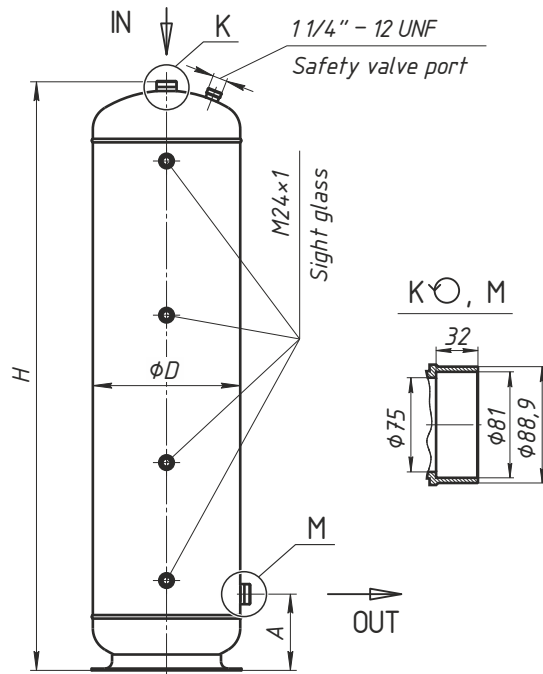
Drawing 4.

Vertical receivers FP-LR-20,0...24,8. Page 4



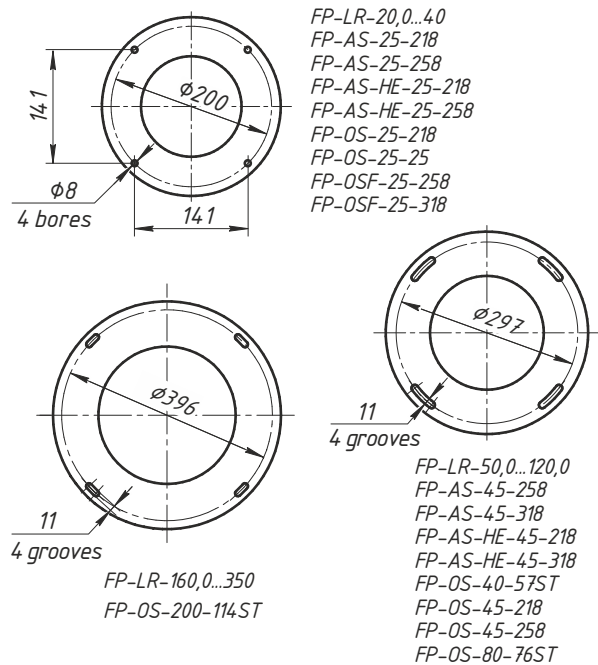
Drawing 5.

Vertical receivers FP-LR-25,0...350,0. Page 4



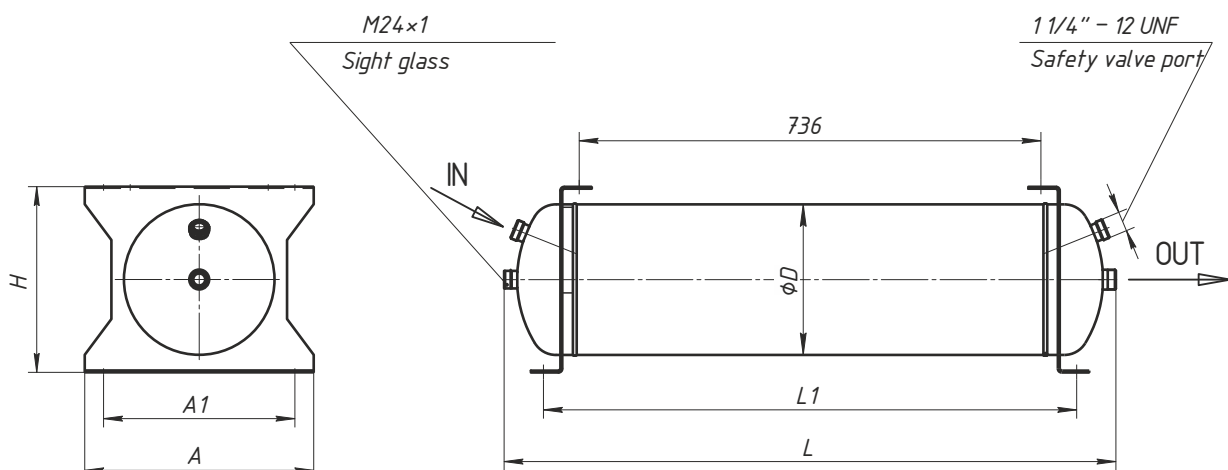
Drawing 6.

Circular platforms for receivers and separators. Page 4, 5, 6



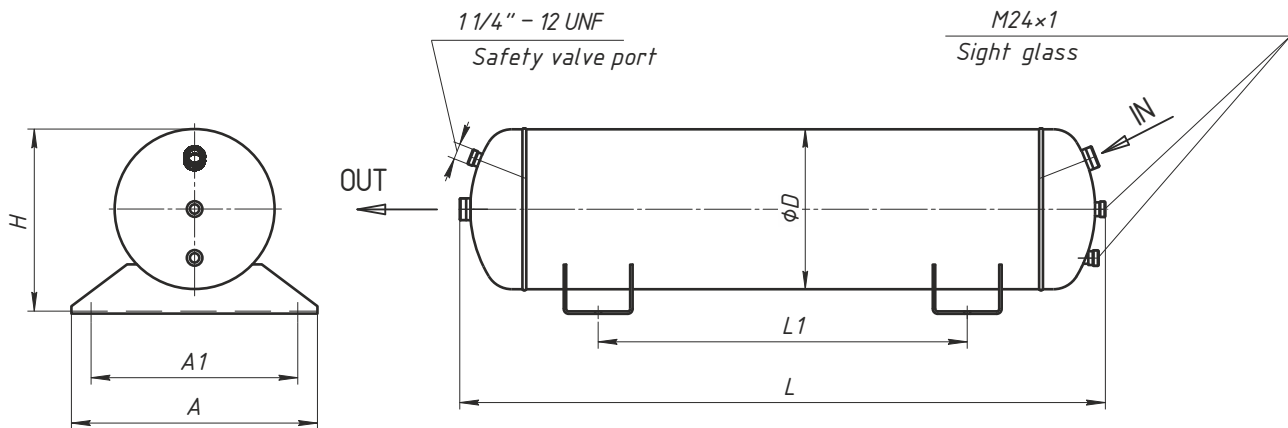
Drawing 7.

Horizontal receivers FP-LRH-16,0...70,0. Page 4



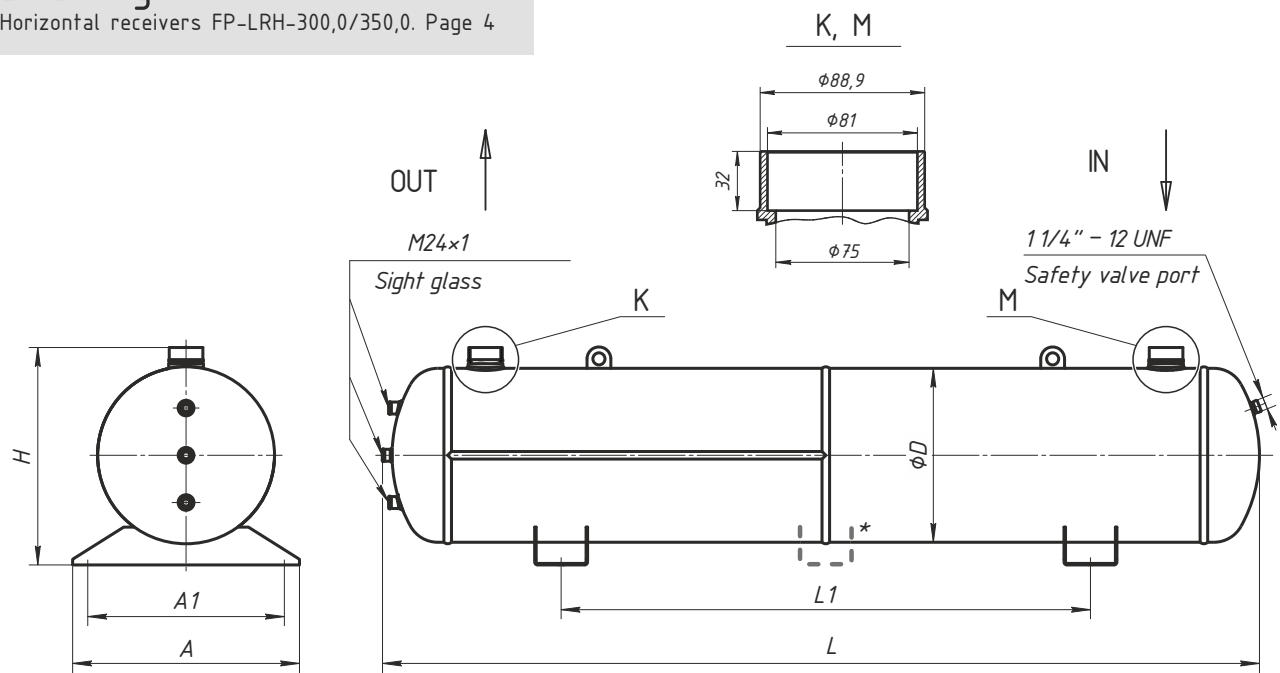
Drawing 8.

Horizontal receivers FP-LRH-100,0....250,0. Page 4



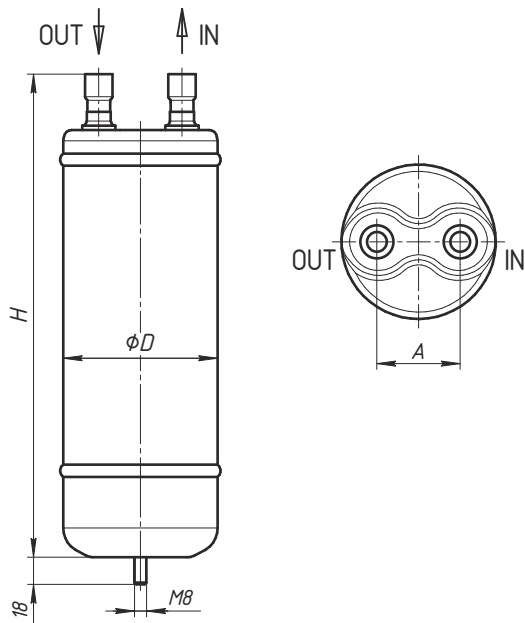
Drawing 9.

Horizontal receivers FP-LRH-300,0/350,0. Page 4



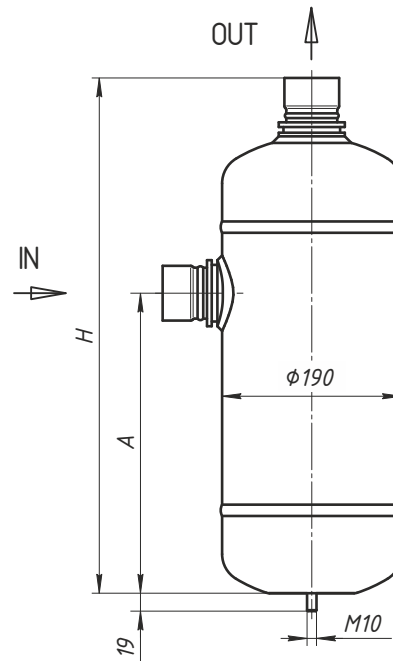
Drawing 10.

Suction accumulators FP-AS-2,0...9,0. Page 5



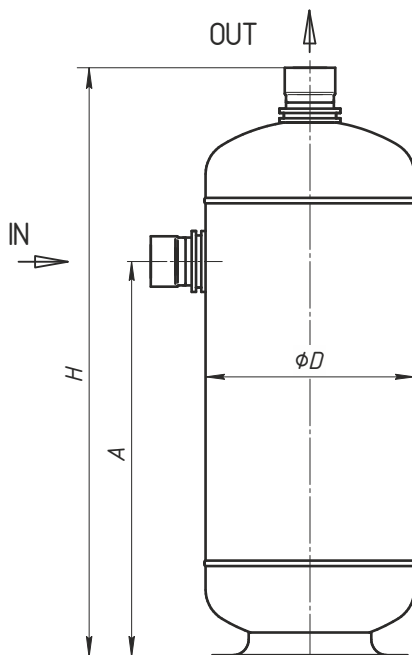
Drawing 11.

Suction accumulators FP-AS-12,0. Page 5



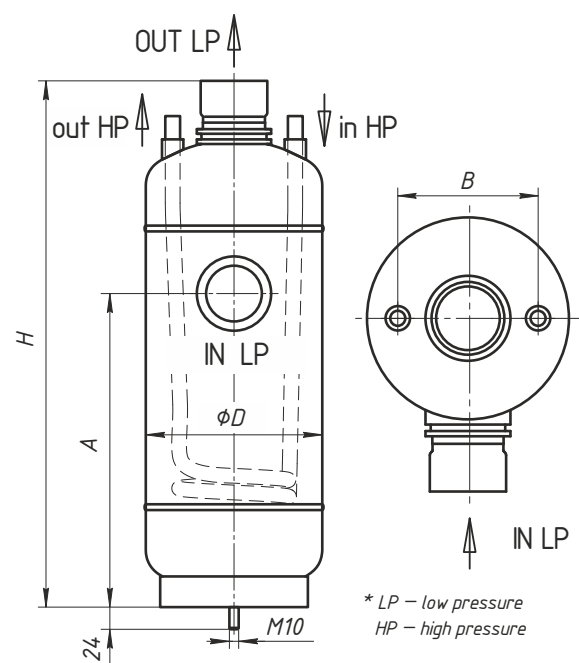
Drawing 12.

Suction accumulators FP-AS-25,0...45,0. Page 5



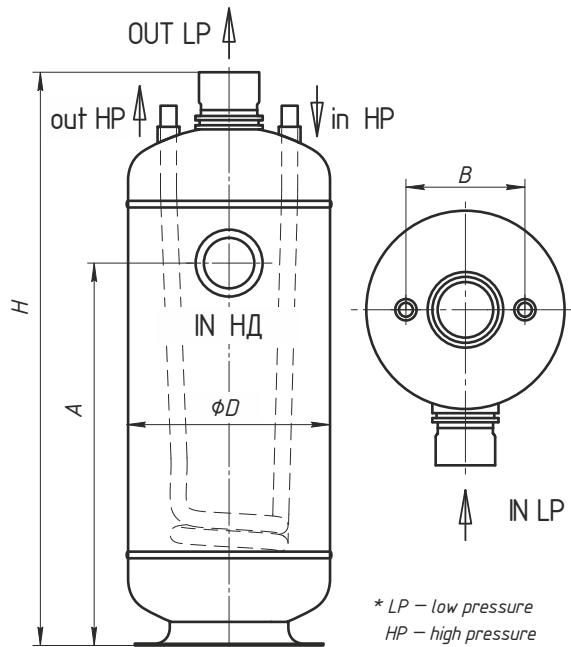
Drawing 13.

Suction accumulators FP-AS-HE-12. Page 5



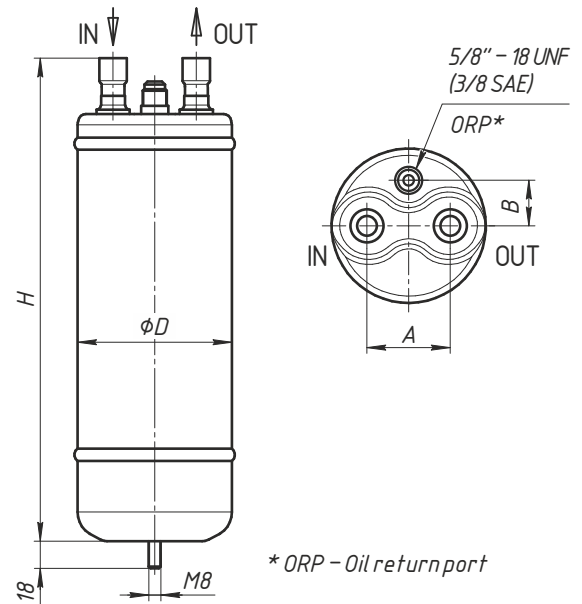
Drawing 14.

Suction accumulators FP-AS-HE-25...45. Page 5



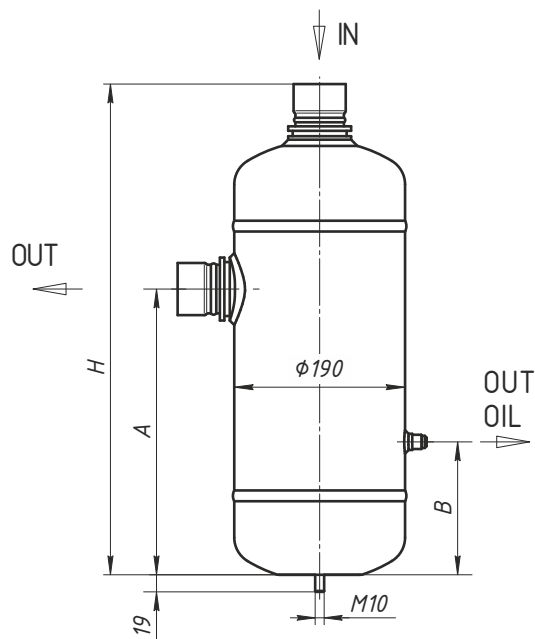
Drawing 15.

Oil separators FP-OS-2,0...7,0. Page 6



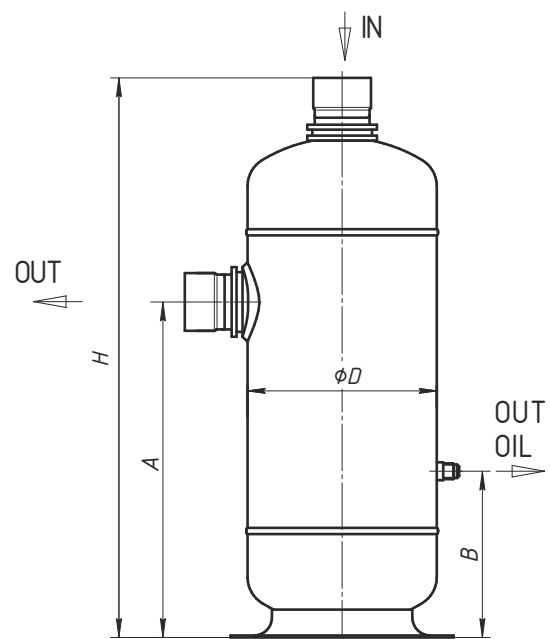
Drawing 16.

Oil separators FP-OS-12. Page 6



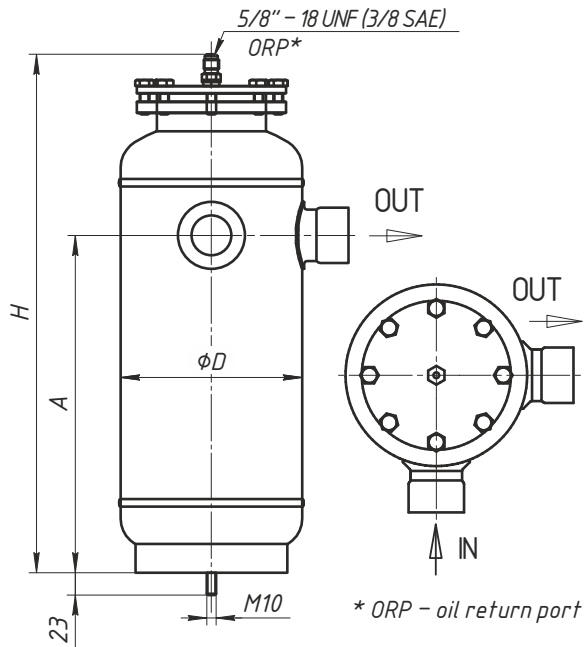
Drawing 17.

Oil separators FP-OS-25...45. Page 6



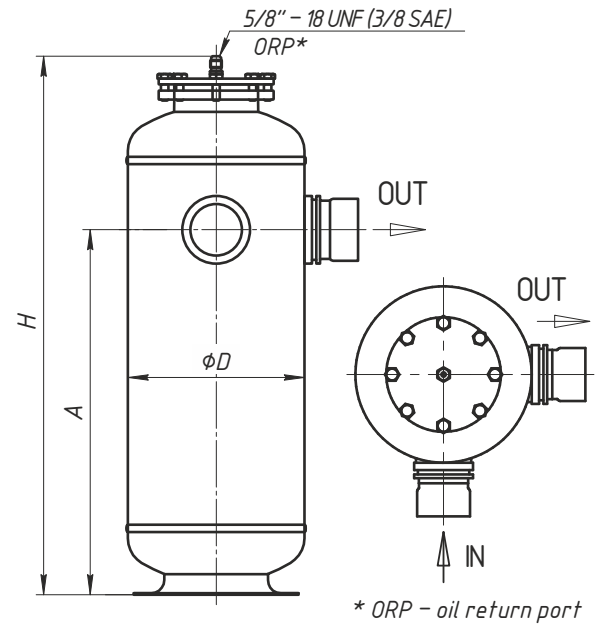
Drawing 18.

Oil separators FP-OSF-12. Page 6



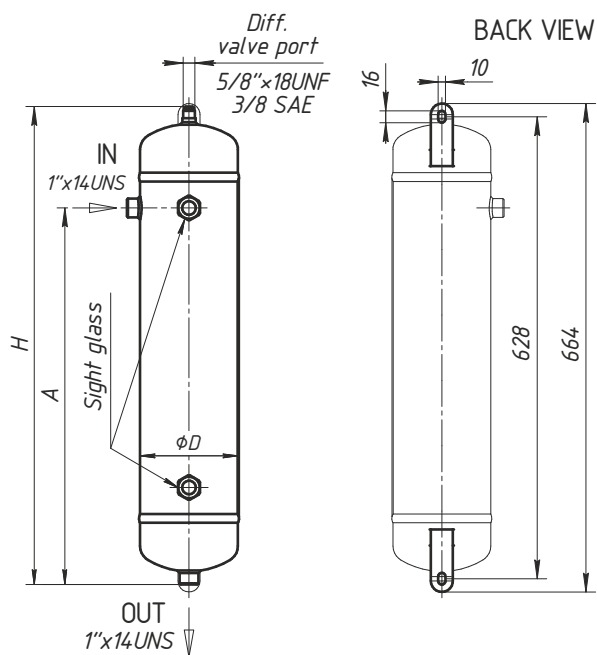
Drawing 19.

Oil separators FP-OSF-25. Page 6



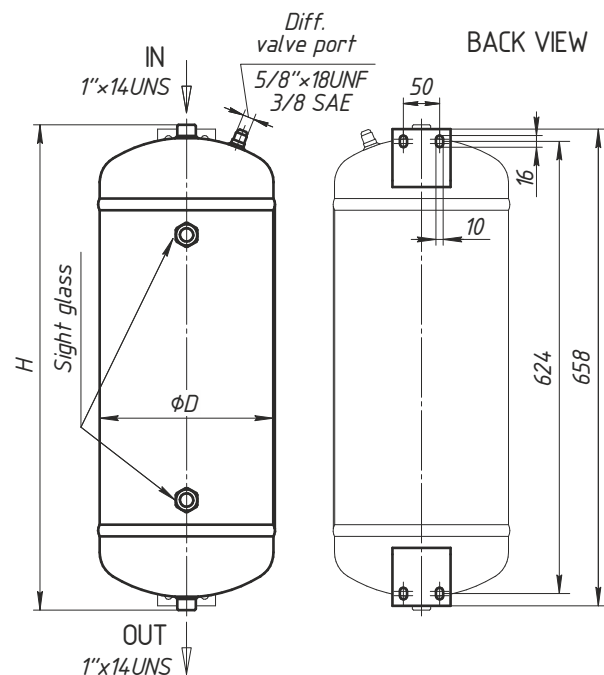
Drawing 20.

Oil receivers FP-OR-5...12. Page 6



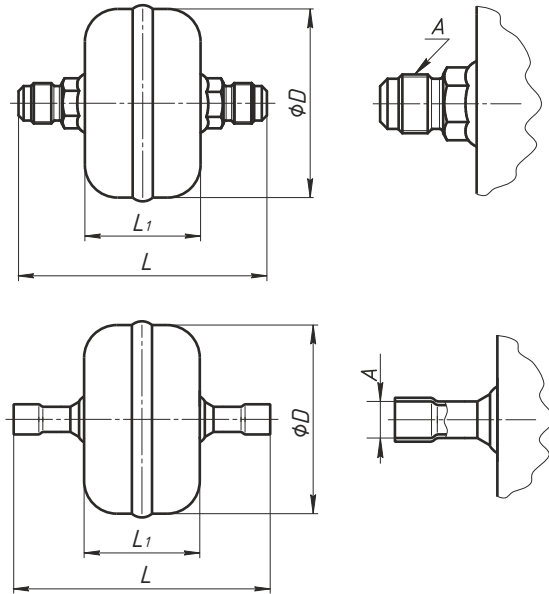
Drawing 21.

Oil receivers FP-OR-16...25. Page 6



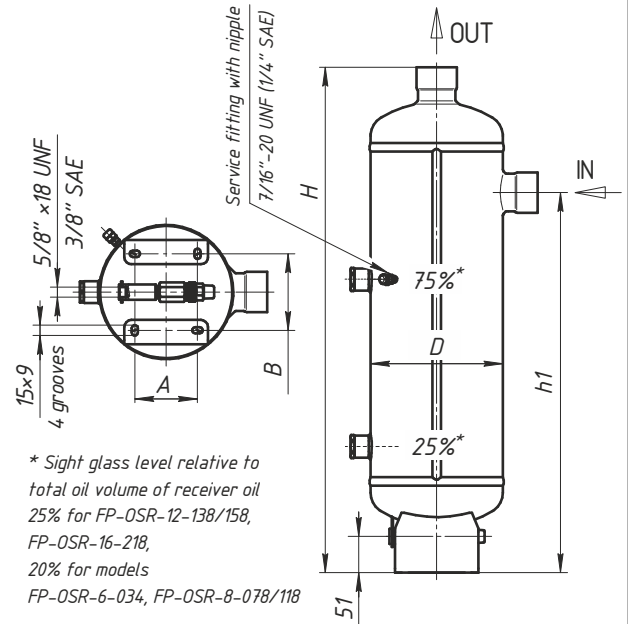
Drawing 22.

Oil filters FP-OF-038/038S. Page 6



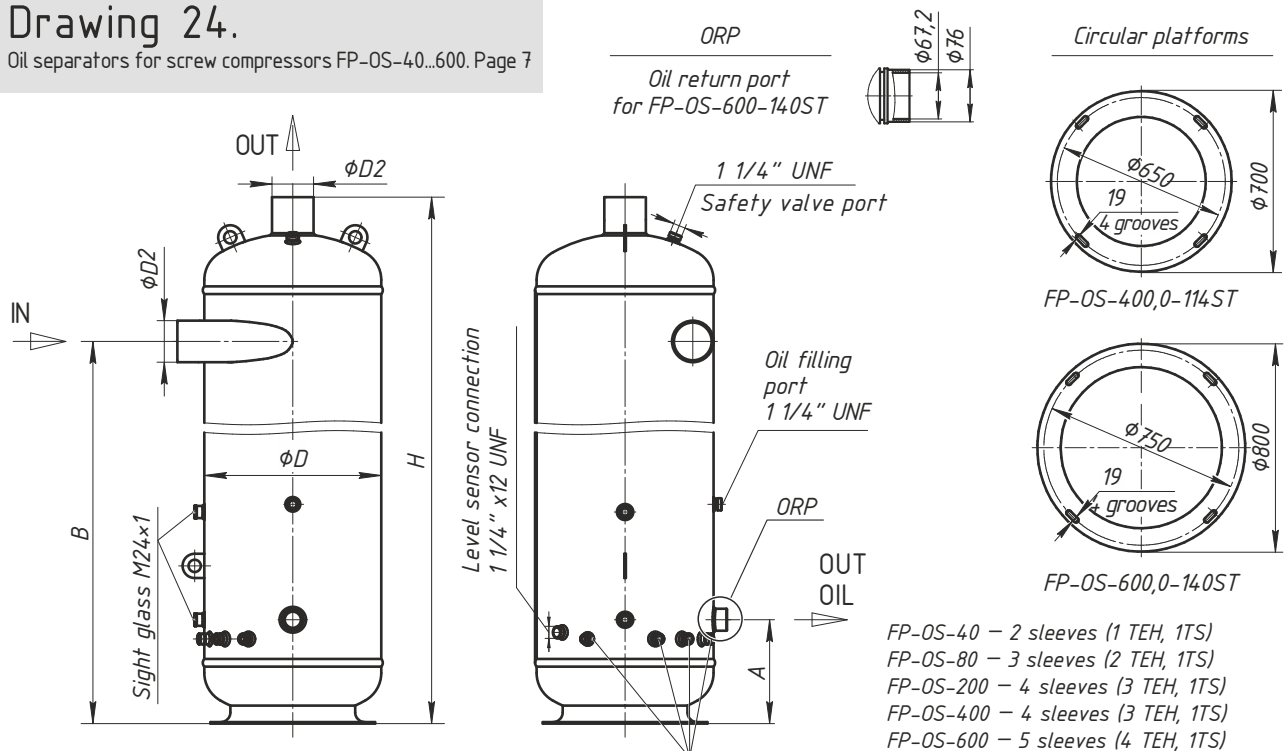
Drawing 23.

Oil separators with oil receiver FP-OSR(MP)-6...16. Page 7



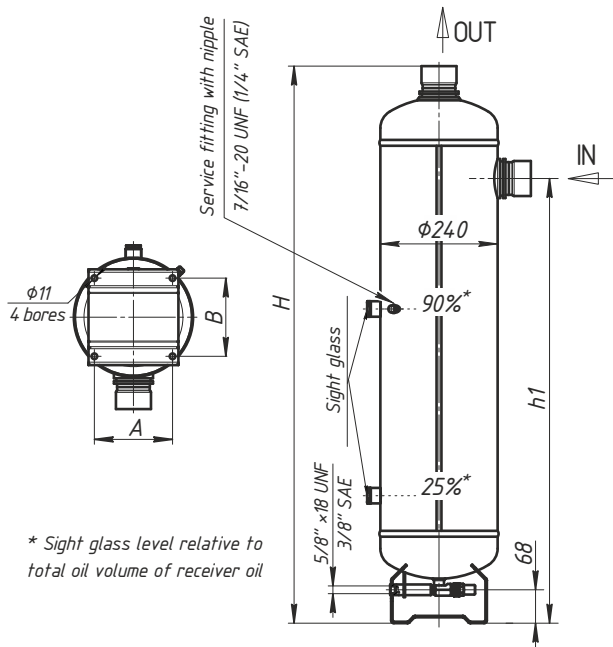
Drawing 24.

Oil separators for screw compressors FP-OS-40...600. Page 7



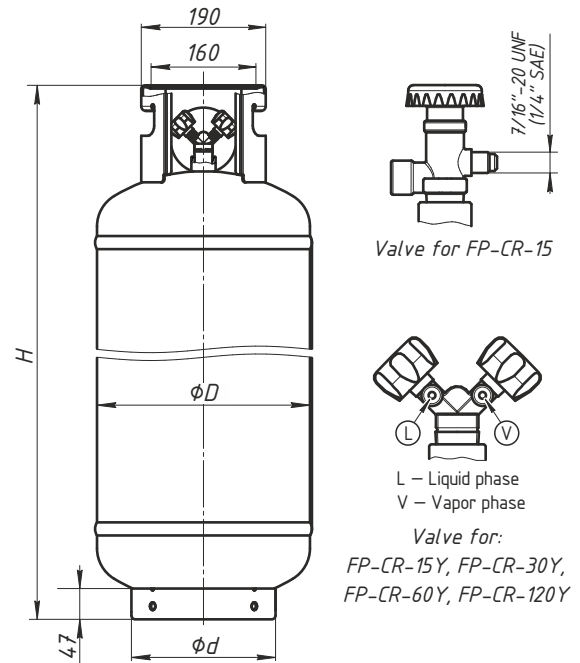
Drawing 25.

Helical oil separators with receiver FP-OSR(MP)-40. Page 7



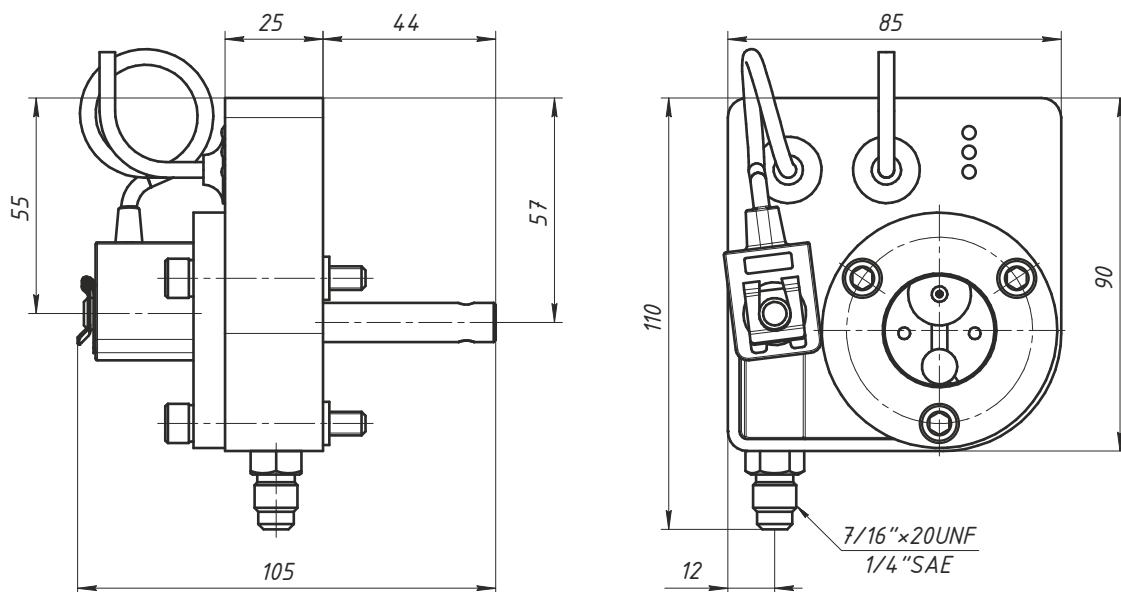
Drawing 26.

Refillable refrigerant cylinders FP-CR. Page 7



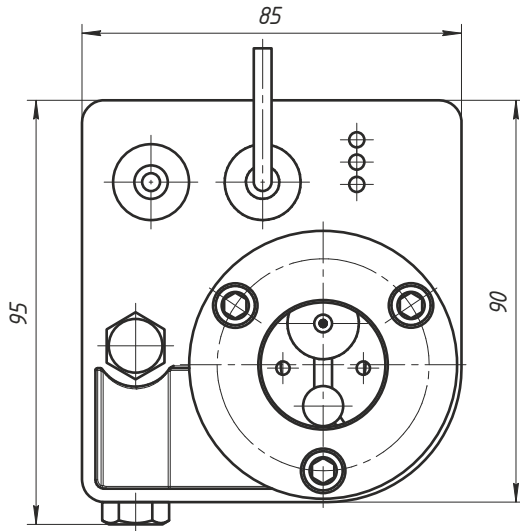
Drawing 27.

Electronic oil level regulators FP-ERL4. Page 8



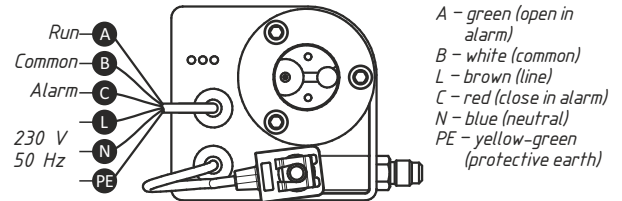
Drawing 28.

Electronic level sensors FP-OLS2/ELS2. Page 9



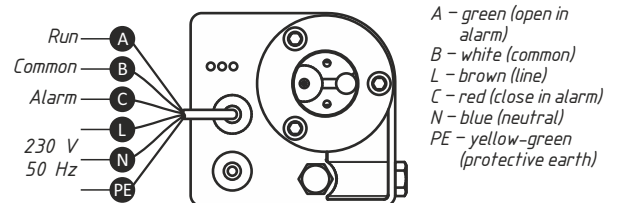
Drawing 29.

Electrical connections FP-ERL4. Page 8



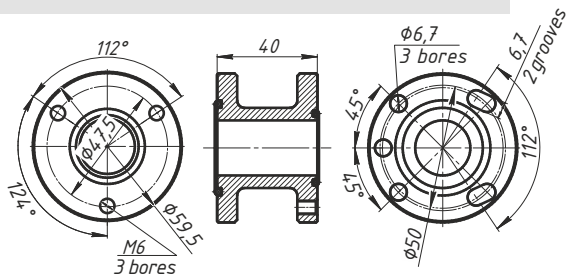
Drawing 30.

Sensors OLS2/ELS2. Electrical connecti. Page 9



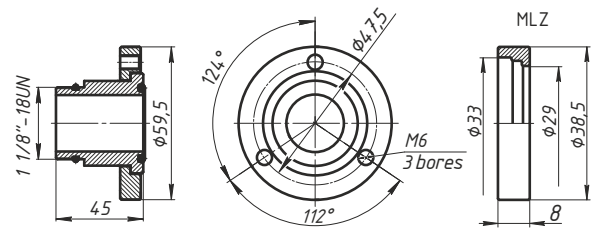
Drawing 31.

Adapter FP-ERL-UA. Page 8



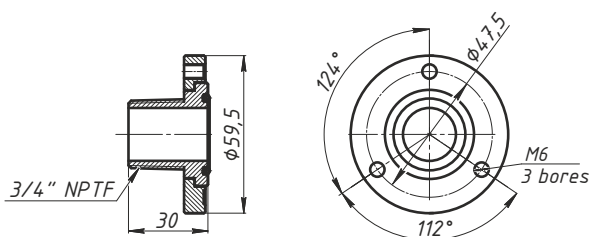
Drawing 32.

Adapter FP-BBL(+MLZ). Page 8



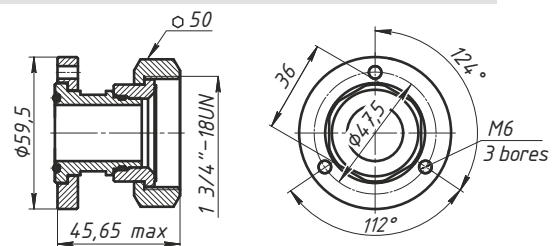
Drawing 33.

Adapter FP-AA. Page 8



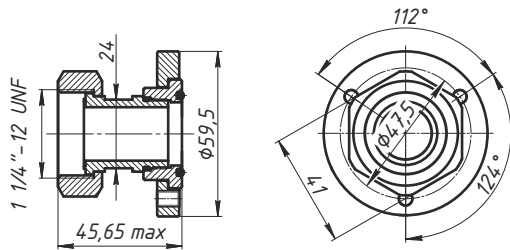
Drawing 34.

Adapter FP-CD. Page 8



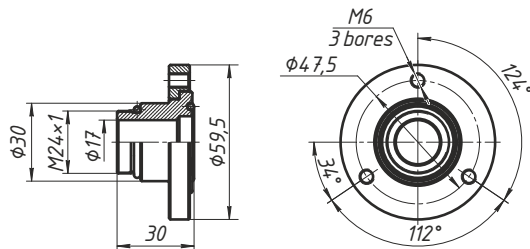
Drawing 35.

Adapter FP-CE. Page 8, 9



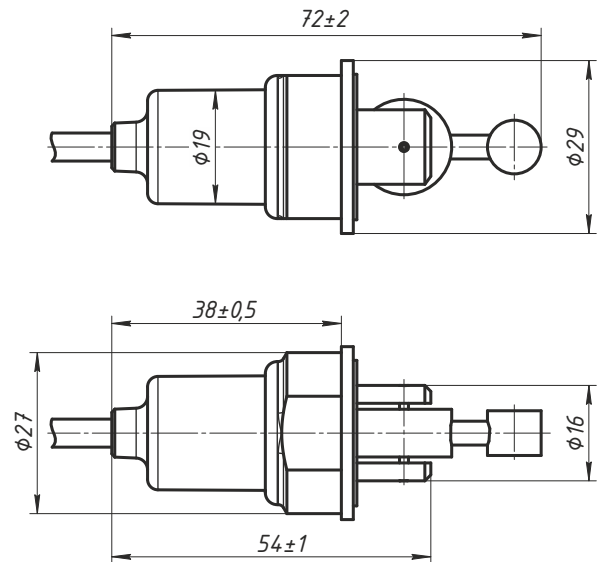
Drawing 36.

Adapter FP-FA. Page 9



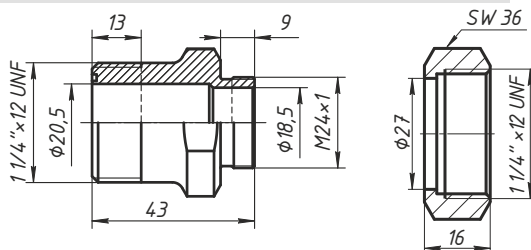
Drawing 37.

Electronic level sensor FP-ELS-L. Page 9



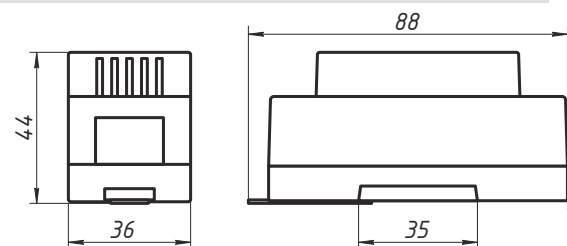
Drawing 38.

Adapter FP-A-M24-114L with nut. Page 9



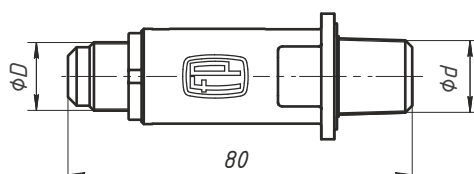
Drawing 39.

Power unit FP-PSU-1-24. Page 9



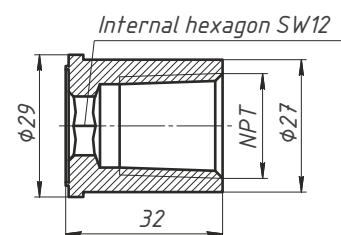
Drawing 40

Safety valves FP-SV. Page 10



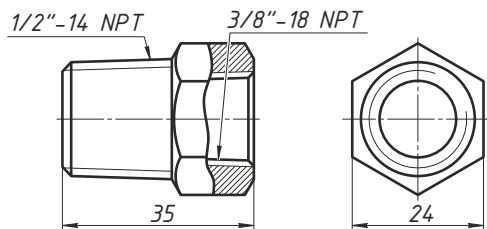
Drawing 41.

Adapters FP-A-012; FP-A-038. Page 10



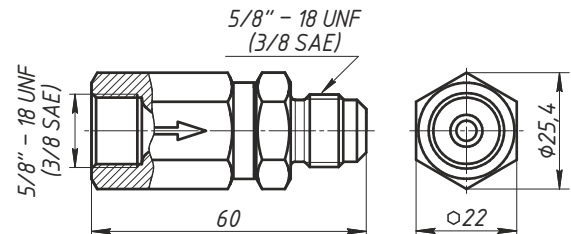
Drawing 42

Adapter FP-A-038-012. Page 10



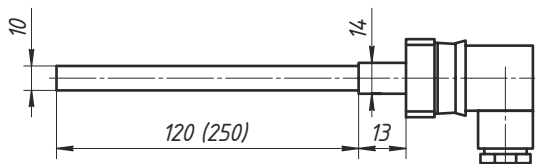
Drawing 43.

Differential check valve. FP-DV. Page 10



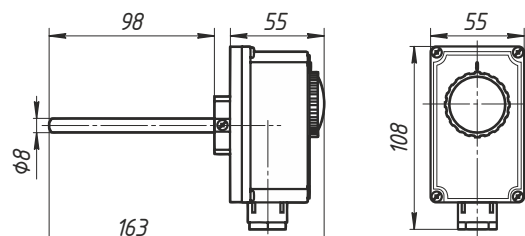
Drawing 44.

Heaters FP-TEH. Page 10



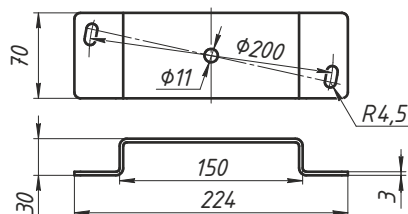
Drawing 45.

Thermostats FP-TS. Page 10



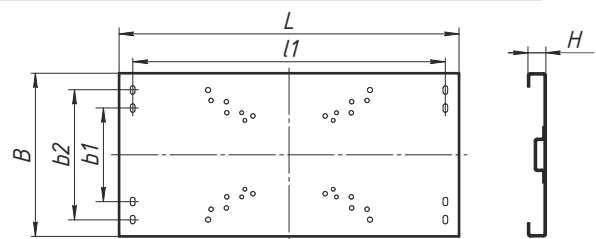
Drawing 46.

Piedestal for receiver FP-ST-LR. Page 10



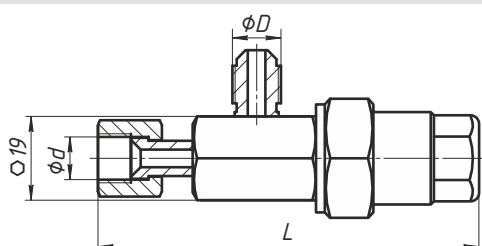
Drawing 47.

Piedestal for horizontal receiver FP-ST-LRH. Page 11



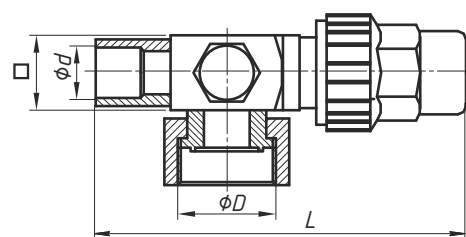
Drawing 48.

Rotalock valves FP-RV-014SAE/038SAE. Page 11



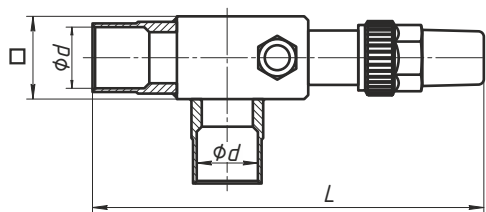
Drawing 49.

Rotalock valves Page 11



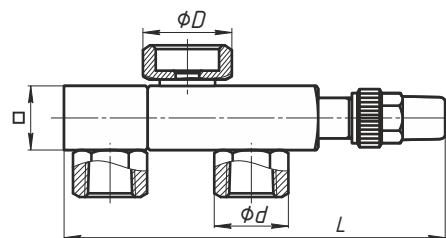
Drawing 50.

Rotalock valves FP-RV-318-318. Page 11



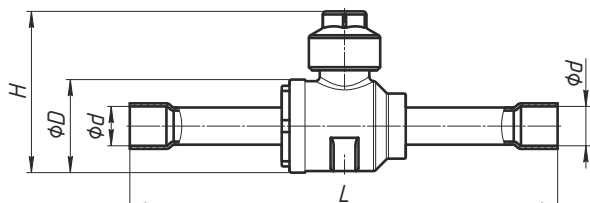
Drawing 51.

Tee valves FP-TV. Page 12



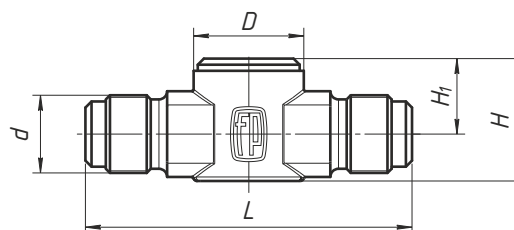
Drawing 52.

Ball Valves FP-BV. Page 12



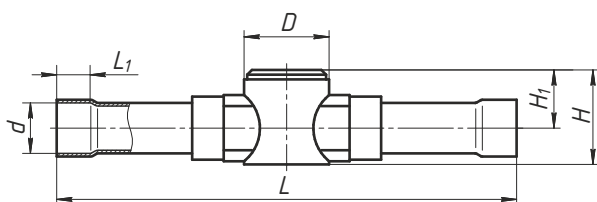
Drawing 53.

Sight glass FP-OG. Page 12



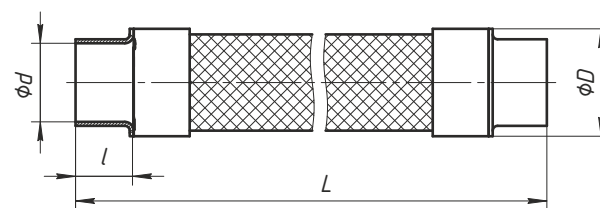
Drawing 54.

Humidity indicator FP-SG. Page 12



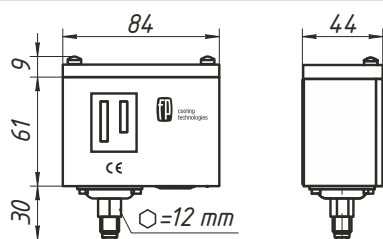
Drawing 55.

Welded vibroeliminators FP-VA. Page 13



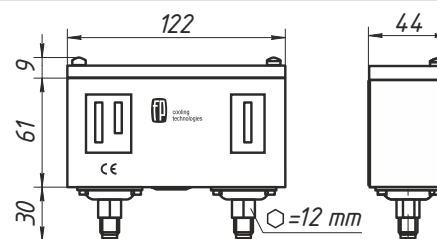
Drawing 56.

Pressure switches FP-PRL, FP-PRH. Page 13



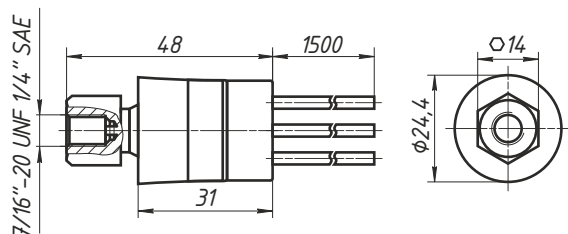
Drawing 57.

Dual pressure switch FP-PRHL. Page 13



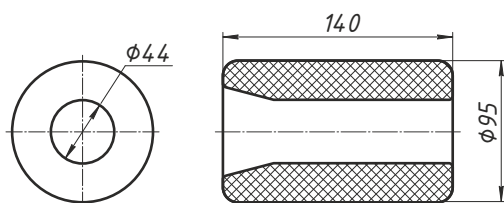
Drawing 58.

Cartridge pressure switches FP-PS. Page 13



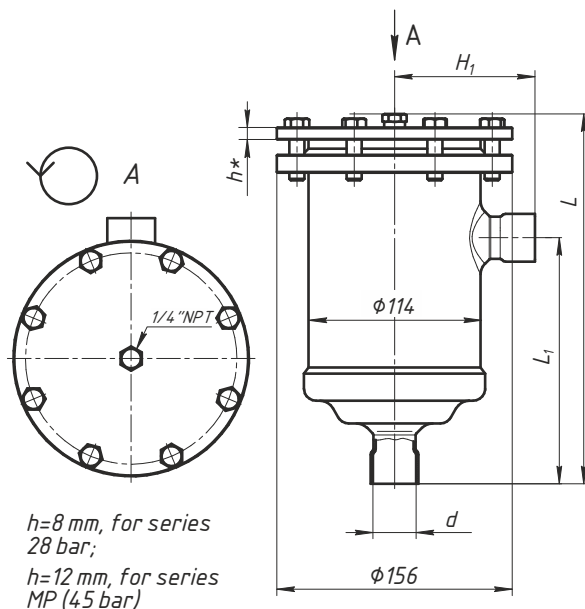
Drawing 60.

Cartridges for filters FP-48DC, FP-48DA, FP-48DM. Page 14



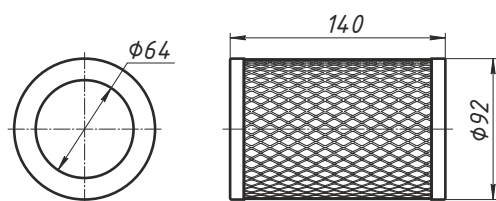
Drawing 59.

Filter-driers with replaceable core FP-SDF. Page 14



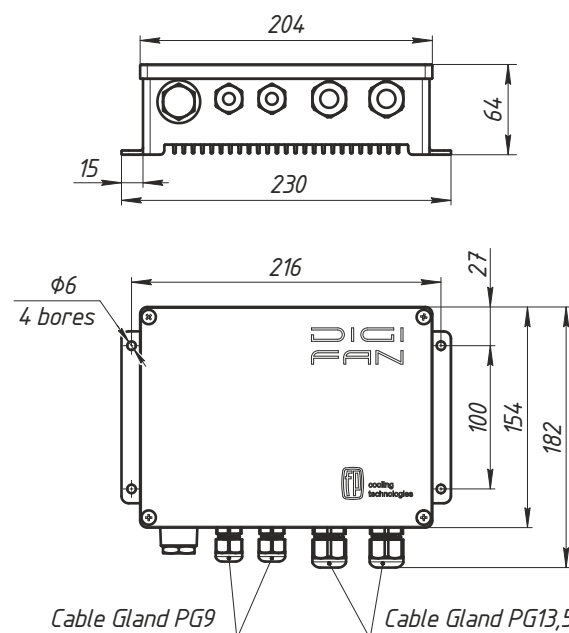
Drawing 61.

Cartridge for filters FP-48F. Page 14



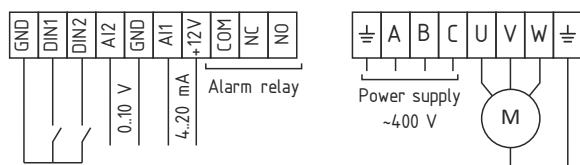
Drawing 62.

Fan speed contro FP-FSR-8. Page 15



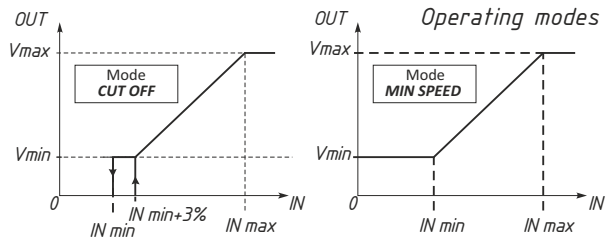
Drawing 63.

Fan speed controller FP-FSR-8 electrical conn. Page 15



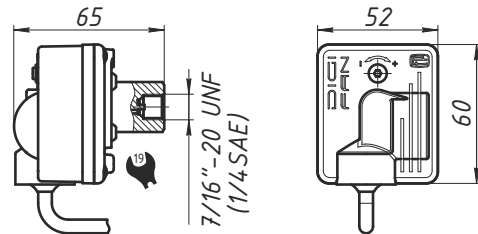
Drawing 64.

Fan speed controller FP-FSR-8. Page 15



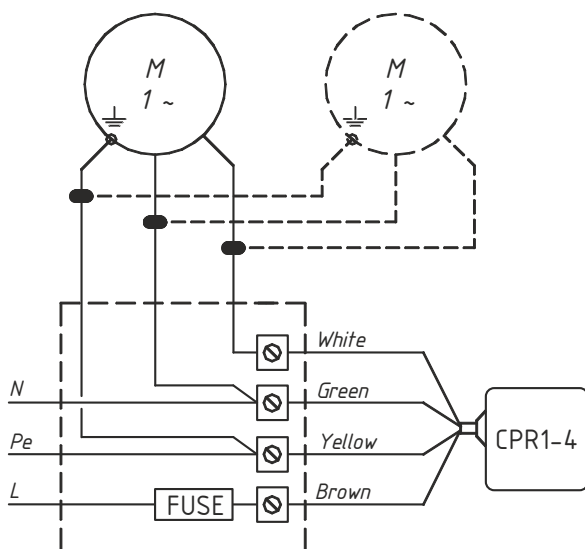
Drawing 65.

Fan speed controller (1-phase) FP-CPR1-4 Page 15



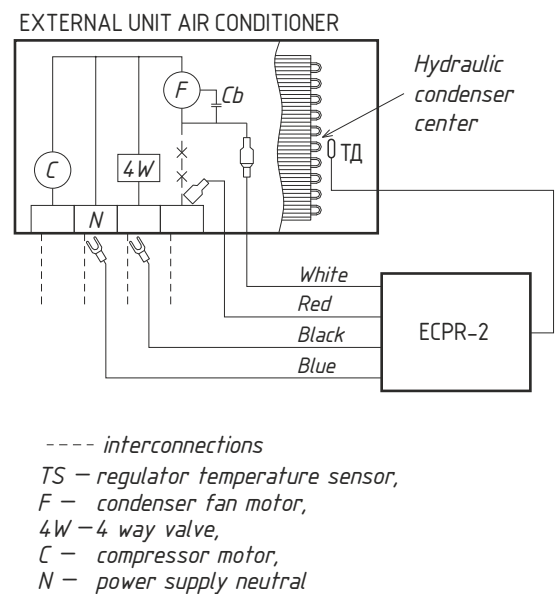
Drawing 66.

FP-CPR1-4 electrical conn. Page 15



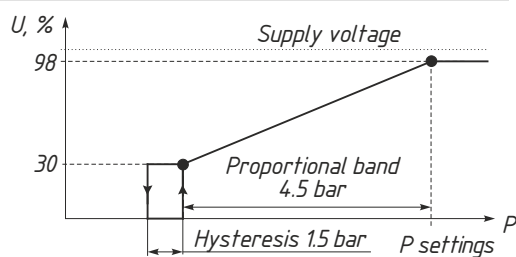
Drawing 68.

FP-ECPR-2 electrical conn. Page 15



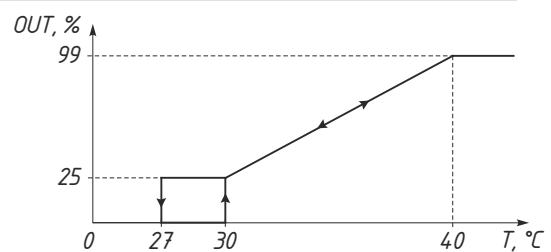
Drawing 67.

Operating principle FP-CPR1-4. Page 15



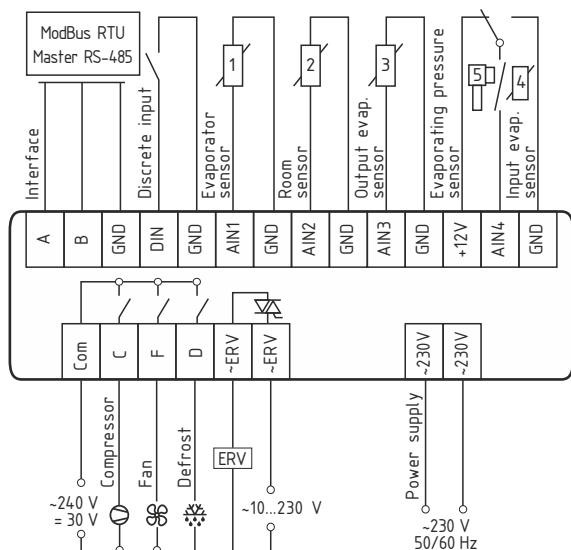
Drawing 69.

Operating principle FP-ECPR-2. Page 15



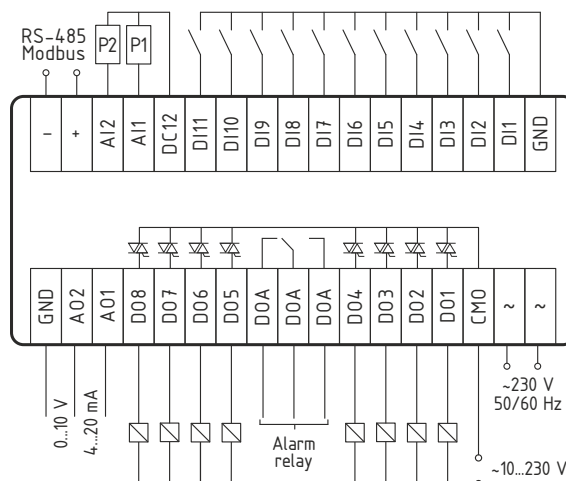
Drawing 70.

FP-MC-R23EM electrical conn. Page 16



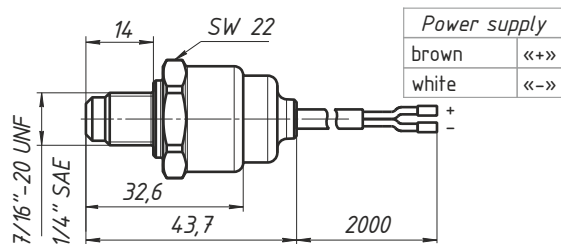
Drawing 71.

FP-MC-CR8220LM electrical conn. Page 16



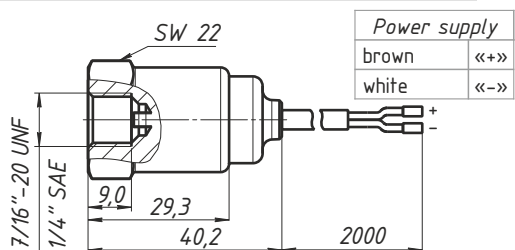
Drawing 72.

Pressure sensors FP-PT-10A(W)/35A(W). Page 17



Drawing 73.

Pressure sensors FP-PT-10B(W); FP-PT-35B(W). Page 17



Drawing 74.

Electronic expansion valves. Page 17

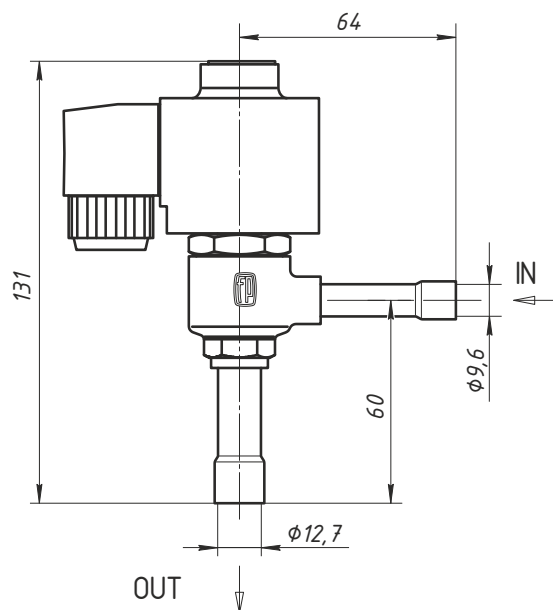


TABLE 1. Connection sizes for ODS (Cu) soldering connections

inch	3/8	1/2	5/8	3/4	7/8	1 1/8	1 3/8	1 5/8	2 1/8	2 5/8	3 1/8
mm	10,0	12,7	16,0	19,1	22,3	28,6	35,0	42,0	54,0	67,0	79,4

TABLE 2. Nominal capacity of the suction accumulators, kW (boiling point = 4 °C), kW

Model	Q ₀ (R22)	Q ₀ (R134A)	Q ₀ (R507)
FP-AS(MP)-2,0-012	7	4	4,5
FP-AS(MP)-2,0-058	10	6	7
FP-AS(MP)-3,5-078	25	15	16
FP-AS(MP)-3,5-118 / FP-AS(MP)-5,0-118	41	25	27
FP-AS(MP)-5,0-138 / FP-AS(MP)-7,0-138	65	37	43
FP-AS(MP)-7,0-158 / FP-AS(MP)-9,0-158	100	61	64
FP-AS(MP)-12,0-218 / FP-AS(MP)-25,0-218	144	105	112
FP-AS(MP)-12,0-258 / FP-AS(MP)-25,0-258 / FP-AS(MP)-45,0-258	159	117	127
FP-AS(MP)-45,0-318	315	256	266
FP-AS(MP)-60,0-114ST	646	254	560

TABLE 3. Correction coefficients for another working conditions

to	4	0	-5	-10	-15	-20	-25	-30	-35	-40
K	1	1,1	1,3	1,7	2	2,5	3	3,5	5	6,5

Formula: $QK = Q_0 \cdot K$ (Q_0 – nominal capacity, K – correction factor, QK – given nominal capacity for selection)

Calculation example:

Q_0 (R22) = 25 kW; t_0 = -11 °C; $K=1,7=(2-1,7)*(-10-(-11))/(-10-(-15))=1,76$; Q_n (R22)=25*1,76=44 kW → FP-AS-5-138

TABLE 4. Selection of helical oil separators with receiver

Model	Cooling capacity at the nominal temperature of the evaporator, kW							
	R404A/507A		R410A		R134a		R407C	
	-30 °C	0 °C	-30 °C	0 °C	-30 °C	0 °C	-30 °C	0 °C
FP-OSR-6-034	16	20	22	27	11	13	19	24
FP-OSR-6-078	24	31	33	41	16	20	29	36
FP-OSR-8-078	27	35	38	47	18	23	30	38
FP-OSR-8-118	29	38	41	50	20	29	33	41
FP-OSR-12-138	39	49	54	61	38	42	46	54
FP-OSR-12-158	52	65	72	81	42	48	61	72
FP-OSR-16-218	94	118	126	153	75	93	105	122
FP-OSR-40-258	215	280	279	372	161	190	262	309

TABLE 5. Kit for oil separators for screw compressors

Model	TEH	Temperat. control	Oil level control	Oil return port	Oil filling port	SVP
FP-OS-40-57 ST	1xFP-TEH-120-150W	FP-TS-90	FP-ELS2+CE /FP-ELS-L	FP-RV-114	FP-RV-114-118	FP-SV-038 or
FP-OS-80-76 ST	2xFP-TEH-120-150W	FP-TS-90		FP-RV-134	FP-RV-114-118	FP-TV-114-038+2xFP-SV-038
FP-OS-200-114 ST	3xFP-TEH-120-150W	FP-TS-90		FP-RV-214	FP-RV-114-118	FP-TV-114-038+2xFP-SV-038
FP-OS-400-114 ST	3xFP-TEH-120-150W	FP-TS-90		FP-RV-214	FP-RV-114-118	FP-TV-114-038+2xFP-SV-038
FP-OS-600-140 ST	4xFP-TEH-120-150W	FP-TS-90		767 mm ODS(St)	FP-RV-114-118	FP-TV-114-038+2xFP-SV-038

TABLE 6. Information about the mass of filling freon cylinders, kg

Model	R22	R134A	R404A	R407C	R410A	R507A
FP-CR-15	12,1	12,3	10,1	11,4	10,2	10,1
FP-CR-15Y	12,1	12,3	10,1	11,4	10,2	10,1
FP-CR-30Y	26,0	26,4	21,6	24,4	21,8	21,5
FP-CR-60Y	52,0	52,9	43,2	48,8	43,6	43,1

* Weight of refrigerant taking into account the recommended filling – 80% of the internal volume of the cylinder

TABLE 7. Moisture content indication

Refrigerant	Moisture content, ppm			
	At a temperature of +25 °C		At a temperature of +43 °C	
	Green/dry	Yellow/wet	Green/dry	Yellow/wet
R22	< 30	> 120	< 50	> 200
R134a	< 30	> 100	< 45	> 170
R404A	< 20	> 70	< 25	> 100
R407C	< 30	> 140	< 60	> 225
R507	< 15	> 60	< 30	> 110

CHART 1. Selection of oil separators

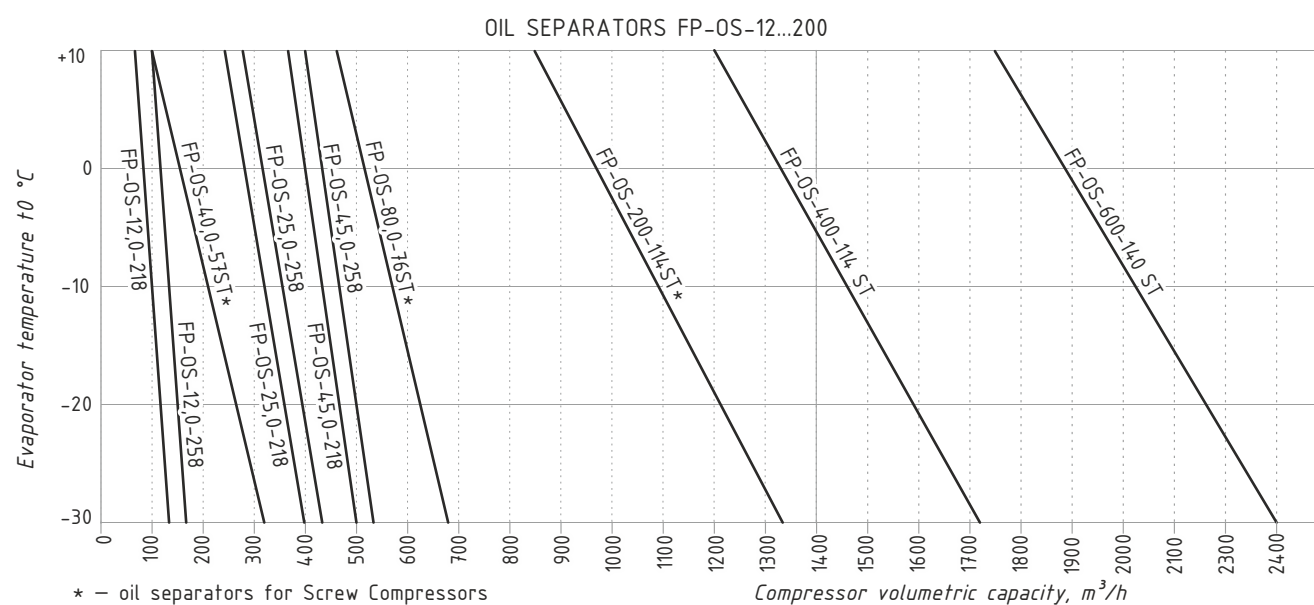
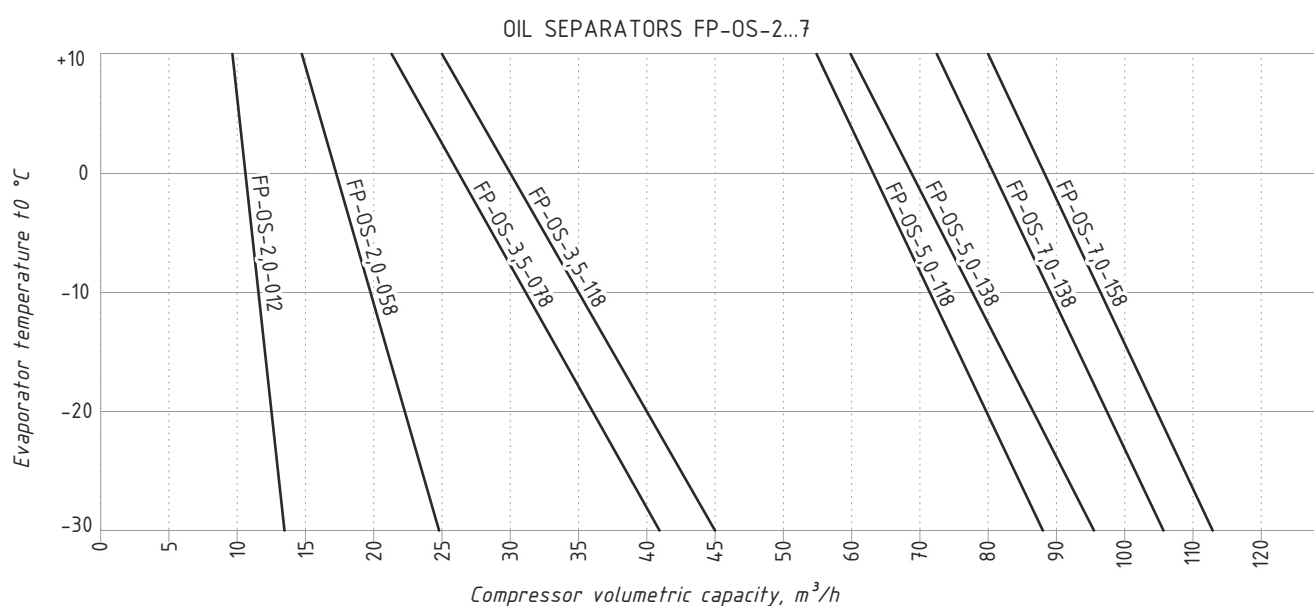
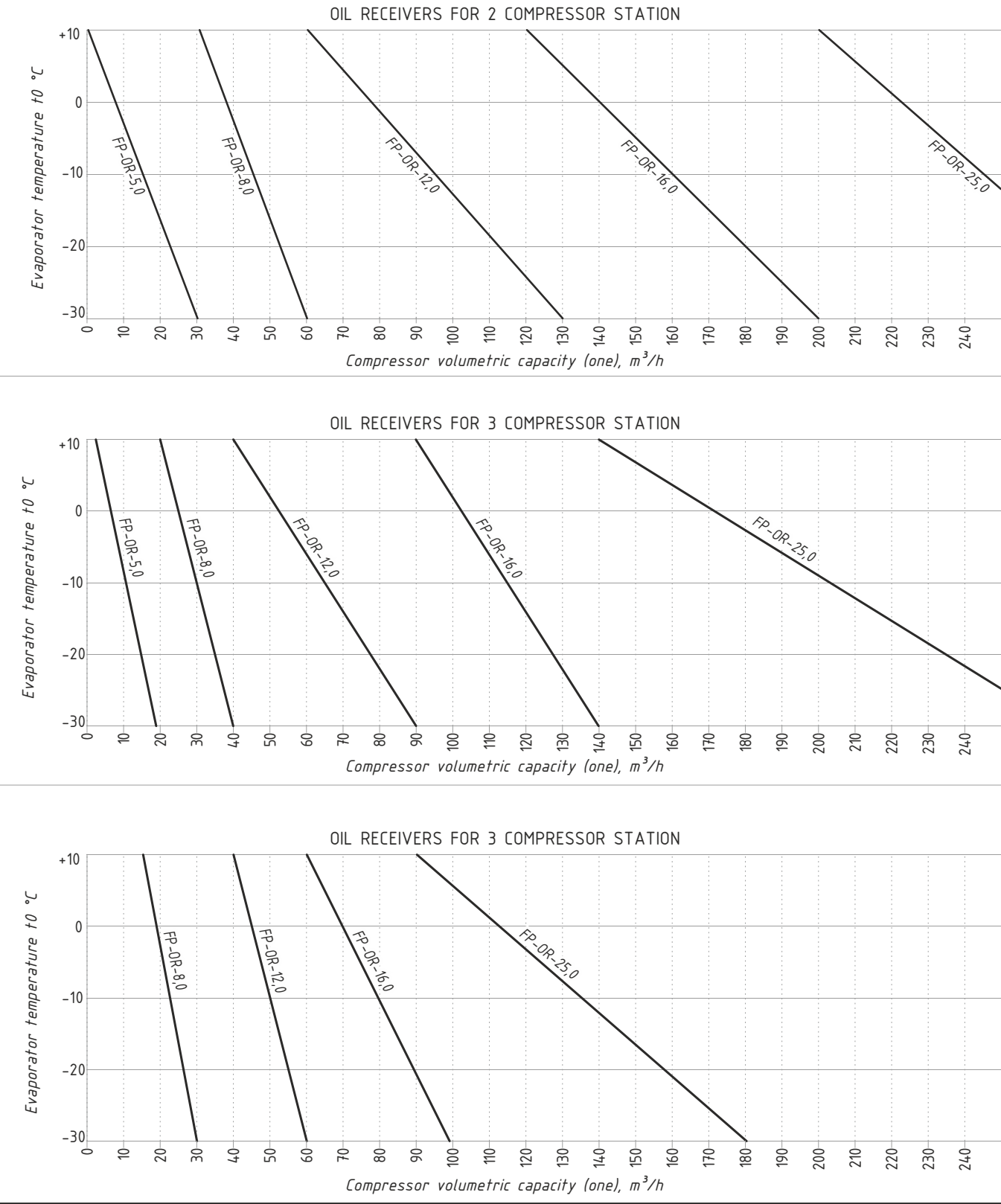


CHART 2. Quick selection chart for oil receivers



The manufacturer reserves the right to make changes in the design of products that do not degrade functional characteristics, without prior agreement with customers.

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