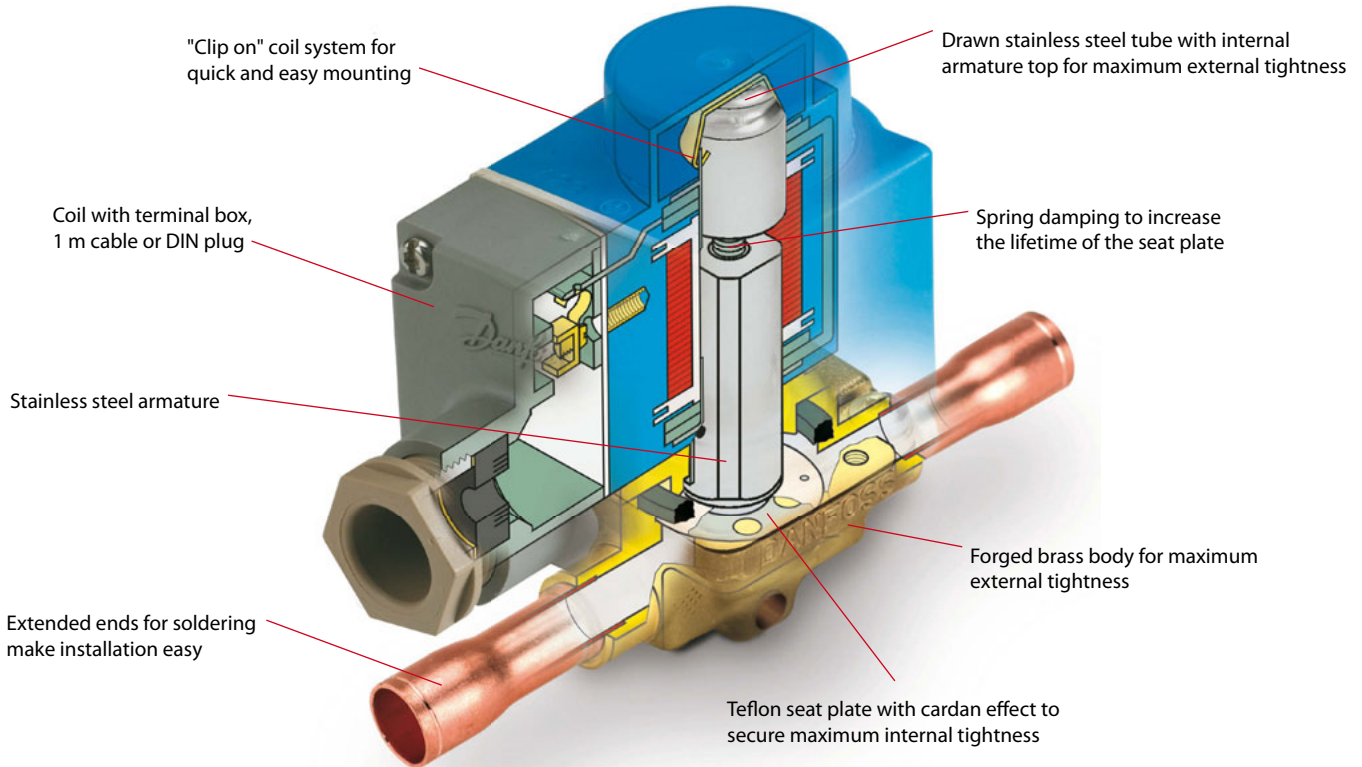


EVR/EVRH - Solenoid valves and coils

EVR valves are direct or servo-operated solenoid valves for liquid, suction and hot gas lines. They are suitable for condensing units and power packs in all refrigeration, freezing and air conditioning applications and are compatible with fluorinated refrigerants, including high-pressure refrigerants such as R410A (EVRH). The valves can be delivered as normally open and normally closed valves as well as with or without manual operation.

Features



Applications

- Traditional refrigeration
- Heat pump systems
- Air conditioning units
- Liquid coolers
- Transport refrigeration

Advantages

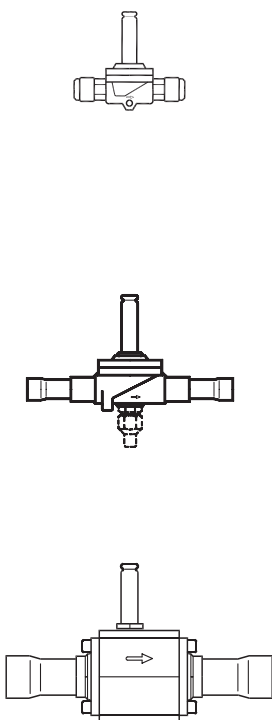
- Complete programme of valves and coils for every application.
- Wide range of coils for a.c. and d.c.
- Wide range of connection types and sizes.
- Normally open or normally closed.
- With or without manual operation.
- High reliability and durability due to maximum internal and external tightness.

Facts

- Can be used for all fluorinated refrigerants (CFC, HCFC and HFC).
- Temperature range: -40 to 105°C
- Max. working pressure (MWP) 32 bar (EVR 2-6, 45.2 bar / EVR 10, 35 bar / EVR 15-40, 32 bar / EVRH 10-20, 45.2).
- MOPD up to 25 bar with 12 W a.c. coil.
- 100% test of functionality, internal/external leakage and electrical characteristics.

Technical data and ordering

Separate valve bodies, normally closed (NC)

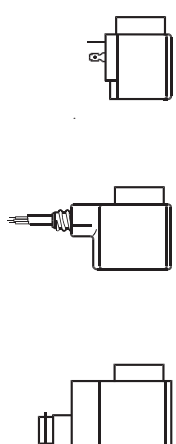


Type	Required coil type	Connection		Code no. Valve body without coil				Max. working pressure bar	k _v value ¹⁾	
		in.	mm	Flare		Solder ODF				
				in./mm	in.	mm	With manual operation			Without manual operation
EVR 2	a.c.	1/4	6	032F8056	032F1201	032F1202		45.2	0.16	
EVR 3	a.c./d.c.	1/4	6	032F8107	032F1206	032F1207		45.2	0.27	
EVR 6		3/8	10	032F8116	032F1204	032F1208				
		3/8	10	032F8072	032F1212	032F1213				
EVR 10		1/2	12	032F8079	032F1209	032F1236		45.2	0.8	
		1/2	12	032F8095	032F1217	032F1218				
EVR 15		5/8	16	032F8098	032F1214	032F1214		35	1.9	
		5/8	16	032F8101	032F1228	032F1228				
		5/8	16	032F8100			032F1227	32	2.6	
EVR 20		a.c.	7/8	22		032F1225	032F1225		32	5.0
			7/8	22		032F1240	032F1240			
	1 1/8	28		032F1244	032F1245					
	d.c.	7/8	22		032F1264	032F1264				
EVR 22	a.c.	1 3/8	35		032F3267	032F3267		32	6.0	
EVR 25	a.c./d.c.	1 1/8					032F2200	032F2201	32	10.0
			28				032F2205	032F2206		
		1 3/8	35				032F2207	032F2208		
EVR 32		1 3/8	35				042H1105	042H1106	32	16.0
		1 5/8					042H1103	042H1104		
EVR 40			42				042H1107	042H1108	32	25.0
		1 5/8					042H1109	042H1110		
			42				042H1113	042H1114		
		2 1/8	54				042H1111	042H1112		
EVRH 10			1/2	12		032G1054	032G1055		45.2	1.9
EVRH 15		5/8	16		032G1056	032G1056			2.6	
EVRH 20	a.c.	7/8	22		032G1057	032G1057			5.0	
EVRH 20	d.c.	7/8	22		032G1058	032G1058			5.0	

Mounting bracket

Mounting bracket	For mounting EVR 2, 3, 6 and 10	032F0197
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Coils - alternating current a.c



Type	Voltage V	Frequency Hz	Code no.				Appendix no.	Power consumption
			With 1 m 3-core cable IP67	With terminal box IP67	With DIN plugs and protective cap IP20	With DIN plugs		
EVR 2 → 40 (NC)	12	50	018F6256	018F6706	018F6181		15	Holding: 10 W 21 VA Inrush: 44 VA
	24	50	018F6257	018F6707	018F6182	018F7358	16	
	42	50	018F6258	018F6708	018F6183		17	
	48	50	018F6259	018F6709	018F6184		18	
	115	50	018F6261	018F6711	018F6186	018F7361	22	
	220-230	50	018F6251	018F6701	018F6176	018F7351	31	
	240	50	018F6252	018F6702	018F6177	018F7352	33	
	380-400	50	018F6253	018F6703	018F6178		37	
	420	50	018F6254	018F6704	018F6179		38	
	24	60	018F6265	018F6715	018F6190		14	
	115	60	018F6260	018F6710	018F6185		20	
	220	60	018F6264	018F6714	018F6189		29	
	240	60	018F6263	018F6713	018F6188		30	
	110	50/60	018F6280	018F6730	018F6192	018F7360	21	
	220-230	50/60	018F6282	018F6732	018F6193	018F7363	32	

Terminal box with LED light indicator

Terminal box	With built-in light emitting indicator diode for solenoid valves	018Z0089
DIN socket		042N0156

¹⁾ The k_v value is the water flow in m³/h at a pressure drop across valve of 1 bar, ρ = 1000 kg/m³.



EVR3/EVRST – Solenoid valves and coils

EVR3 and EVRST are valves made of stainless steel. EVR3 is direct operated. EVR3 10, 15 and 20 are servo operated. EVRST 10,15 and 20 are forced servo operated valves used in liquid, suction, hot gas and oil return lines with ammonia or fluorinated refrigerants.



Advantages and features

- Stainless steel valve body and connections
- Max. working pressure 50 barg (suitable for CO₂ subcritical).
- Used for ammonia and all fluorinated refrigerants
- MOPD up to 38 bar with 20 watt a.c. coil
- Wide choice of a.c. and d.c. coils
- Designed for temperatures of media up to 105°C
- Manual stem on EVR3 and EVRST 10, EVRST 15 and EVRST 20

Technical data and ordering

Technical data

Refrigerants

R717 (NH₃), R22, R134a, R404A; R744; R410A etc.

Temperature of medium

-40 → +105°C for 10 or 12 watt coil. Max. 130°C during defrosting.

-40 → +80°C for 20 watt coil.

Ambient temperature and enclosure for coil: See "Coils for solenoid valves", lit.no. DKRCC.PD.BS0.A4

Type	Opening differential pressure Δp bar					k _v value ²⁾ m ³ /h	Max. working pressure Ps
	Min.	Max. (MOPD) liquid ¹⁾					
		10 W a.c.	12 W a.c.	20 W a.c.	20 W d.c.		
EVRS 3	0.0	21	25	38	14	0.23	50 barg
EVRS 10	0.05	21	25	38	18	1.5	
EVRST 10	0.0	14	21	38	16	1.5	
EVRS 15	0.05	21	25	38	18	2.7	
EVRST 15	0.0	14	21	38	18	2.7	
EVRS 20	0.05	21	25	38	13	4.5	28 barg for R717, HCFC, HFC, R744 ³⁾ 50 barg only for R744, R410A ⁴⁾
EVRST 20	0.0	14	21	38	13	4.5	

¹⁾ MOPD for media in gas form is approx. 1 bar greater.

²⁾ The k_v value is the water flow in m³/h at a pressure drop in the valve of 1 bar, ρ = 1000 kg/m³.

³⁾ All refrigerants in group I according to Pressure Equipment Directive PED 97/23/CE article 9 section 2.1

Group I comprises fluids defined as:

- explosive
- extremely flammable
- highly flammable
- flammable (where the maximum allowable temperature is above flashpoint)
- very toxic
- toxic
- oxidizing

⁴⁾ Only for refrigerants in group 2 according to Pressure Equipment Directive PED 97/23/CE article 9 section 2.2

Group 2 comprises all other fluids not referred to in 2.1

Type	Rated capacity ¹⁾ kW														
	Liquid					Suction vapour					Hot gas				
	R717	R22	R134a	R404A/ R507	R410A	R717	R22	R134a	R404A/ R507	R410A	R717	R22	R134a	R404A/ R507	R410A
EVRS 3	21.8	4.6	4.3	3.2	4.5						6.5	2.1	1.7	1.7	2.3
EVRS/EVRST 10	142.0	30.2	27.8	21.1	29.7	9.0	3.4	2.5	3.1	4.3	42.6	13.9	11.0	11.3	14.9
EVRS/EVRST 15	256.0	54.4	50.1	38.0	53.5	16.1	6.2	4.4	5.5	7.7	76.7	24.9	19.8	20.3	26.7
EVRS/EVRST 20	426.0	90.6	83.5	63.3	89.1	26.9	10.3	7.3	9.2	12.0	128.0	41.5	32.9	33.9	44.5

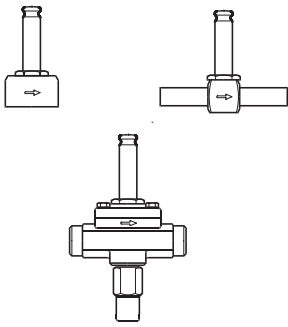
¹⁾ Rated liquid and suction vapour capacity is based on evaporating temperature t_e = -10°C, liquid temperature ahead of valve t_l = +25°C, and pressure drop across valve Δp = 0.15 bar.

Rated hot gas capacity is based on condensing temperature t_c = +40°C, pressure drop across valve Δp = 0.8 bar, hot gas temperature t_h = +60°C, and subcooling of refrigerant Δt_{sub} = 4 K.

Type	R 744 Rated capacity kW ²⁾	
	Liquid	Suction
EVRS 3	6.65	-
EVRS/ EVRST 10	43.3	6.9
EVRS/ EVRST 15	78.0	12.4
EVRS/ EVRST 20	130.0	20.7

²⁾ Rated liquid and suction vapour capacity is based on evaporating temperature t_e = -40°C, liquid temperature ahead of the valve t_l = -8°C and pressure drop across the valve Δp = 0.15 bar

Code numbers



Separate valve bodies

Type	Max. working pressure Ps barg	Connection		Code no.	
		Weld in.	Pipe thread ISO 228/1	With manual stem	Without manual stem
EVRS 3	50	3/8			032F3080
EVRS 3	50		G 1/4		032F3081
EVRS 10	50	1/2		032F3082	
EVRS 10	50	1/2		032F3083	
EVRS 15	50	3/4		032F3084	
EVRS 15	50	3/4		032F3085	
EVRS 20	28	1		032F3086	
EVRS 20	28	1		032F2237	
EVRS 20	50	1		032F5437	
EVRS 20	50	1		032F5438	

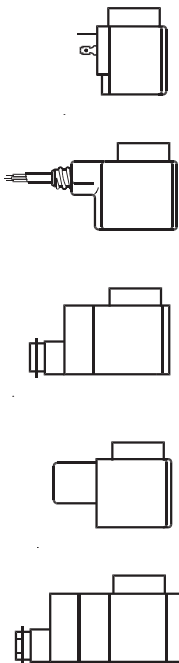
Coils See "Coils for solenoid valves", lit.no. DKRCC.PD.BS0.A4.

Clip-on coils

Valve type	Voltage V	Frequency Hz	Code no.				Appendix no.**)	Power consumption
			With 1 m 3-core cable	With terminal box	With DIN plugs and protect. cap IP20	With DIN plugs**)		
			IP67	IP67				

Alternating current a.c.

EVR 2 → 40 (NC) EVR 6 → 22 (NO) EVRH 4 → 40 EVRC EVRA EVRAT EVRS / EVRST EVM (NC)	12	50	018F6256	018F6706	018F6181		15	Holding: 10 W 21 VA Inrush: 44 VA
	24	50	018F6257	018F6707	018F6182	018F7358	16	
	42	50	018F6258	018F6708	018F6183		17	
	48	50	018F6259	018F6709	018F6184		18	
	115	50	018F6261	018F6711	018F6186	018F7361	22	
	220-230	50	018F6251	018F6701	018F6176	018F7351	31	
	240	50	018F6252	018F6702	018F6177	018F7352	33	
	380-400	50	018F6253	018F6703	018F6178		37	
	420	50	018F6254	018F6704	018F6179		38	
	24	60	018F6265	018F6715	018F6190		14	
	115	60	018F6260	018F6710	018F6185		20	
	220	60	018F6264	018F6714	018F6189		29	
	240	60	018F6263	018F6713	018F6188		30	
	110	50/60	018F6280	018F6730	018F6192	018F7360	21	
220-230	50/60	018F6282	018F6732	018F6193	018F7363	32		



Direct current d.c.

Coil type I

EVR 2 → 15 (NC) EVR 25 → 40 (NC/NO) EVR 6 → 15 (NO) EVRC 10 → 15 EVRA 3 → 15 (NC) EVRA 25 → 40 (NC) EVRAT 10 → 15 (NC) EVRS / EVRST 3 → 15 EVM (NC/NO)	12			018F6856			01	20 W
	24			018F6857			02	
	48			018F6859			04	
	110			018F6860			06	
	115			018F6861			07	
	220			018F6851			09	

Direct current d.c.

Coil type II

EVR 20 → 22 (NC/NO) EVRC 20 EVRA 20 EVRAT 20 EVRST 20	12			018F6886			01	20 W
	24			018F6887			02	
	48			018F6889			04	
	110			018F6890			06	
	220			018F6881			09	

See "Opening differential pressure" under "Technical data" for the valve concerned.

*) Indicates voltage and frequency

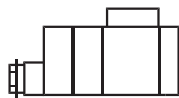
**) Can only be used with DIN socket

***) When replacing a coil with terminal box, it is sufficient to change the coil unit itself. Therefore, order coil with DIN plugs and protective cap.

Code numbers

Special coils

Valve type	Voltage	Frequency	Code no.	Appendix no. Indicates voltage and frequency	Power consumption
	V	Hz	With terminal box IP67		



Alternating current a.c.

EVRS / EVRST	24	50	018F6807	16	Holding: 12 W 26 VA Inrush: 55 VA
	42	50	018F6808	17	
	48	50	018F6809	18	
	110	50	018F6811	22	
	220-230	50	018F6801	31	
	240	50	018F6802	33	
	380-400	50	018F6803	37	
	24	60	018F6815	14	
	110	60	018F6813	20	
	220	60	018F6814	29	

Alternating current a.c.

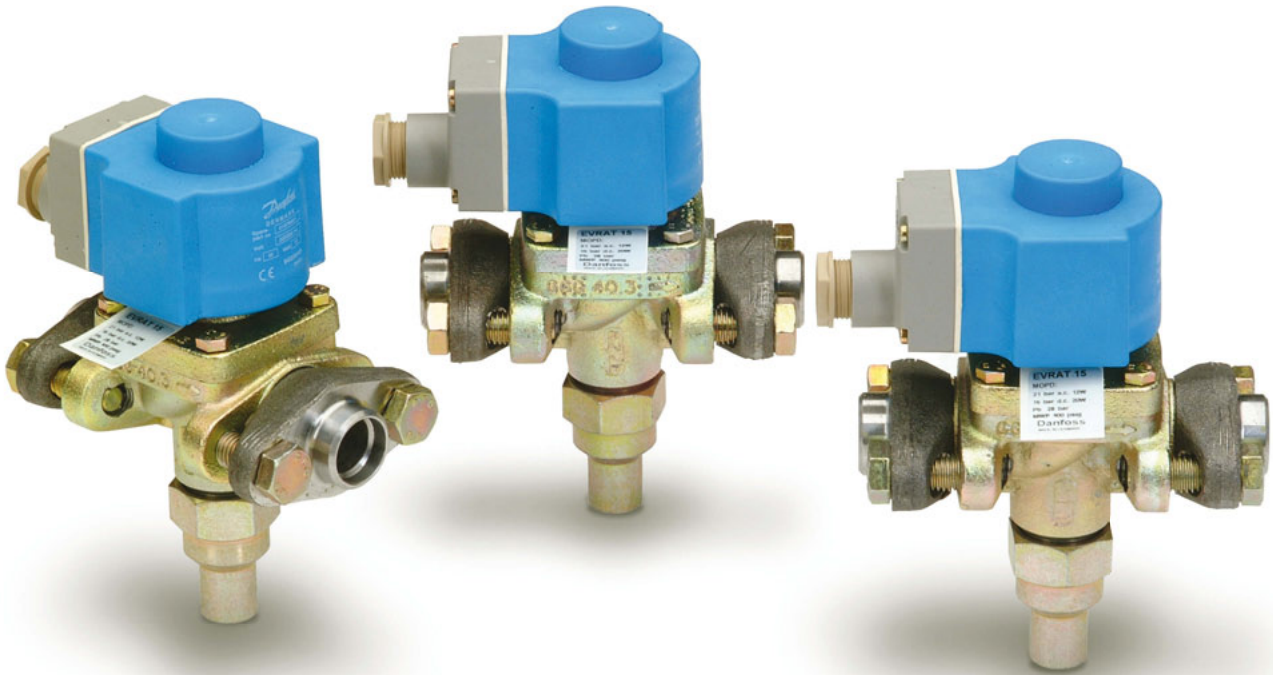
EVR/EVRST	24	50	018F6901	Holding: 20 W 45VA Inrush: 65VA
	24	60	018F6902	
	230	50	018F6905	

Recommended use for EVRH with high MOPD (38 bar)



EVRA/EVRAT – Solenoid valves/coils

EVRA is a direct or servo operated solenoid valve for liquid, suction and hot gas lines with ammonia or fluorinated refrigerants. EVRA valves can be supplied as complete valves or as components, i.e. valve body, flanges and coils. EVRAT has capacities similar to the EVRA but has the advantage of no opening pressure differential is needed – it will open – and stay open, also when there is no flow through that valve.



Advantages and features

- EVRA and EVRAT valves can be used for all non-flammable refrigerants, including R 717, and non-corrosive gases/liquids – assuming seals of correct material are used
- EVRA and EVRAT valves uses a teflon gasket which ensures a very high tightness across valve seat
- EVRA valves has a low pressure drop
- EVRAT valves has a minimal opening differential pressure of 0 (zero)
- The EVRA and EVRAT valves offers a wide range of flange connection dimensions in accordance with standards: DIN ANSI, SOC, SA and FPT
- The EVRA and EVRAT valve range can be used with the wide range of standard Danfoss coils
- Strainer type FA can be mounted directly on the valve body except for EVRA 32 and 40

Connections

There is a wide range of connection possibilities with EVRA 3 to 25 and EVRAT 10-20:

- Butt welding DIN (2448)
- Butt welding ANSI (3/8 - 1½ in. B36.10 schedule 80, 2 in. B36.10 schedule 40)
- Socket welding ANSI (B 16.11)
- Solder connection DIN (2856)
- Solder connection ANSI (B 16.22)
- FPT internal thread, NPT (ANSI/ASME B 1.20.1)

EVRA 32 and 40 are supplied with integrated flanges for either:

- Welding DIN (2448) or
- Welding ANSI (B 36.10)

Technical data and code numbers

Technical data

Type	Opening differential pressure with standard coil Δp bar				Temperature of medium °C	Max. working pressure PB bar	kv-value m ³ /h
	Min.	Max. (= MOPD) liquid ²⁾					
		10 W a.c.	12 W a.c.	20 W d.c.			
EVRA 3	0.00	21	25	14	-40 → 105	42	0.23
EVRA 10	0.05	21	25	18			1.5
EVRAT 10	0.00	14	21	16			1.5
EVRA 15	0.05	21	25	18			2.7
EVRAT 15	0.00	14	21	16			2.7
EVRA 20	0.05	21	25	13			4.5
EVRAT 20	0.00	14	21	13			4.5
EVRA 25	0.20	21	25	14			10.0
EVRA 32	0.20	21	25	14			16.0
EVRA 40	0.20	21	25	14			25.0

¹⁾ The kv-value is the water flow in m³/h at a pressure drop across valve of 1 bar, $\rho = 1000 \text{ kg/m}^3$.

²⁾ MOPD for media in gas form is approx. 1 bar greater.

Code numbers

Complete valves without flanges

	Type	Connection	Code no. ¹⁾	
			10 W coil with 1 m cable	10 W coil with terminal box
Valves with manual operation	EVRA 3	See table "Flange set"	032F3102	032F3103
	EVRA 10		032F6207	032F6208
Valves without manual operation	EVRA 10	See table "Flange set"	032F6212	032F6213
	EVRA 15		032F6217	032F6218
	EVRA 20		032F6222	032F6223

¹⁾ Valve body with gaskets, bolts and 10 W a.c. coil. Please specify code no., voltage and frequency. Voltage and frequency can also be given in the form of an appendix number, see table "Appendix numbers", under EVR.

Separate valve bodies

	Type	Connection	Required coil type	Code no.
Valves with manual operation	EVRA 10	See table Flange set	a.c. / d.c.	032F6210
	EVRAT 10		a.c. / d.c.	032F6214
	EVRA 15		a.c. / d.c.	032F6215
	EVRAT 15		a.c. / d.c.	032F6216
	EVRA 20		a.c.	032F6220
	EVRA 20		d.c.	032F6221
	EVRAT 20		a.c. / d.c.	032F6219
Valves without manual operation	EVRA 25	See table Flange set	a.c. / d.c.	032F6225
	EVRA 3		a.c. / d.c.	032F3050
	EVRA 10		a.c. / d.c.	032F6211
	EVRA 25		a.c. / d.c.	032F6226

Separate valve bodies with butt weld connections

	Type	Size	Butt weld connection	
			DIN	ANSI
			Code no.	Code no.
Valves with manual operation	EVRA 32	1 ¼ in.	042H1126	042H1140
	EVRA 32	1 ½ in.	042H1131	042H1141
	EVRA 40	1 ½ in.	042H1128	042H1142
	EVRA 40	2 in.	042H1132	042H1143

Flange sets

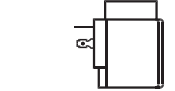
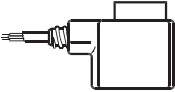
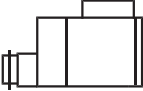
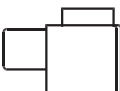
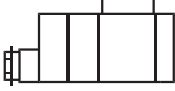
	Connection	Code no.		
		mm	in.	
EVRA 3, 10 and 15 EVRAT 10 and 15	Butt welding DIN (2448), Tongue flange sets	10	3/8	027N1112
		15	1/2	027N1115
		20	3/4	027N1120
	Butt welding ANSI B 36.10, Tongue flange sets	10	3/8	027N2020
		15	1/2	027N2021
		20	3/4	027N2022
	Socket welding ANSI (B 16.11), Tongue flange sets	10	3/8	027N2010
		15	1/2	027N2011
	Solder DIN (2856), Tongue flange sets	16		027L1116
		22		027L1122
		5/8	027L1117	
Solder ANSI B 16.22, Tongue flange sets		7/8	027L1123	
	FPT internal thread, NPT (ANSI / ASME B 1.20.1), Tongue flange sets	10	3/8	027G1005
EVRA 20 and 25 EVRAT 20	Butt welding DIN (2448), Tongue flange sets	15	1/2	027G1006
		20	3/4	027N1220
		25	1	027N1225
		32	1 ¼	027N1230
	Butt welding ANSI B 36.10, Tongue flange sets	20	3/4	027N3031
		25	1	027N3032
		32	1 ¼	027N3033
		20	3/4	027N2001
	Socket welding ANSI (B 16.11), Tongue flange sets	25	1	027N2002
		Soldering DIN (2856), Tongue flange sets	22	
	Soldering ANSI B 16.22, Tongue flange sets	28		027N1228
			7/8	027N1223
			1 1/8	027N1229
		FPT internal thread, NPT (ANSI / ASME B 1.20.1), Tongue flange sets	20	3/4
	25	1	027G1002	

Code numbers

Clip-on coils

Valve type	Voltage V	Frequency Hz	Code no.				Appendix no. *)	Power consumption
			With 1 m 3-core cable IP67	With terminal box IP67	With DIN plugs and protect. cap IP20	With DIN plugs**)		

Alternating current a.c.

    	EVR 2 → 40 (NC)	12	50	018F6256	018F6706	018F6181		15	Holding: 10 W 21 VA Inrush: 44 VA
	EVR 6 → 22 (NO)	24	50	018F6257	018F6707	018F6182	018F7358	16	
	EVRH 4 → 40	42	50	018F6258	018F6708	018F6183		17	
	EVRC	48	50	018F6259	018F6709	018F6184		18	
	EVRA	115	50	018F6261	018F6711	018F6186	018F7361	22	
	EVRAT	220-230	50	018F6251	018F6701	018F6176	018F7351	31	
	EVRS / EVRST	240	50	018F6252	018F6702	018F6177	018F7352	33	
	EVM (NC)	380-400	50	018F6253	018F6703	018F6178		37	
		420	50	018F6254	018F6704	018F6179		38	
		24	60	018F6265	018F6715	018F6190		14	
		115	60	018F6260	018F6710	018F6185		20	
		220	60	018F6264	018F6714	018F6189		29	
		240	60	018F6263	018F6713	018F6188		30	
		110	50/60	018F6280	018F6730	018F6192	018F7360	21	
		220-230	50/60	018F6282	018F6732	018F6193	018F7363	32	

Direct current d.c.

Coil type I

EVR 2 → 15 (NC)	12			018F6856			01	20 W
EVR 25 → 40 (NC/NO)	24			018F6857			02	
EVR 6 → 15 (NO)	48			018F6859			04	
EVRC 10 → 15	110			018F6860			06	
EVRA 3 → 15 (NC)	115			018F6861			07	
EVRA 25 → 40 (NC)	220			018F6851			09	
EVRAT 10 → 15 (NC)								
EVRS / EVRST 3 → 15								
EVM (NC/NO)								

Direct current d.c.

Coil type II

EVR 20 → 22 (NC/NO)	12			018F6886			01	20 W
EVRC 20	24			018F6887			02	
EVRA 20	48			018F6889			04	
EVRAT 20	110			018F6890			06	
EVRST 20	220			018F6881			09	

See "Opening differential pressure" under "Technical data" for the valve concerned.

*) Indicates voltage and frequency

**) Can only be used with DIN socket

***) When replacing a coil with terminal box, it is sufficient to change the coil unit itself. Therefore, order coil with DIN plugs and protective cap.