

## **solenoid valves**



**The ultimate Technology  
for fluid control**

ISO 9001 Certified Quality System

COMPANY WITH QUALITY SYSTEM  
CERTIFIED BY DNV  
=ISO 9001/2000=



European  
Community  
Conformity



Underwriters  
Laboratories  
Quality  
Certificate



**The ultimate Technology  
for fluid control**

**m & m** international

**spirax**  
**/sarco** Engineering Group

## means:

- Working with a staff of qualified professionals
- Enjoying the benefits of the most advanced technological research
- Quality at competitive price
- Warranty of a company conforming to the rigorous ISO 9001/2000 requirements
- Reliability of a 30-year experience on international markets
- To partner with a company belonging to a multinational group

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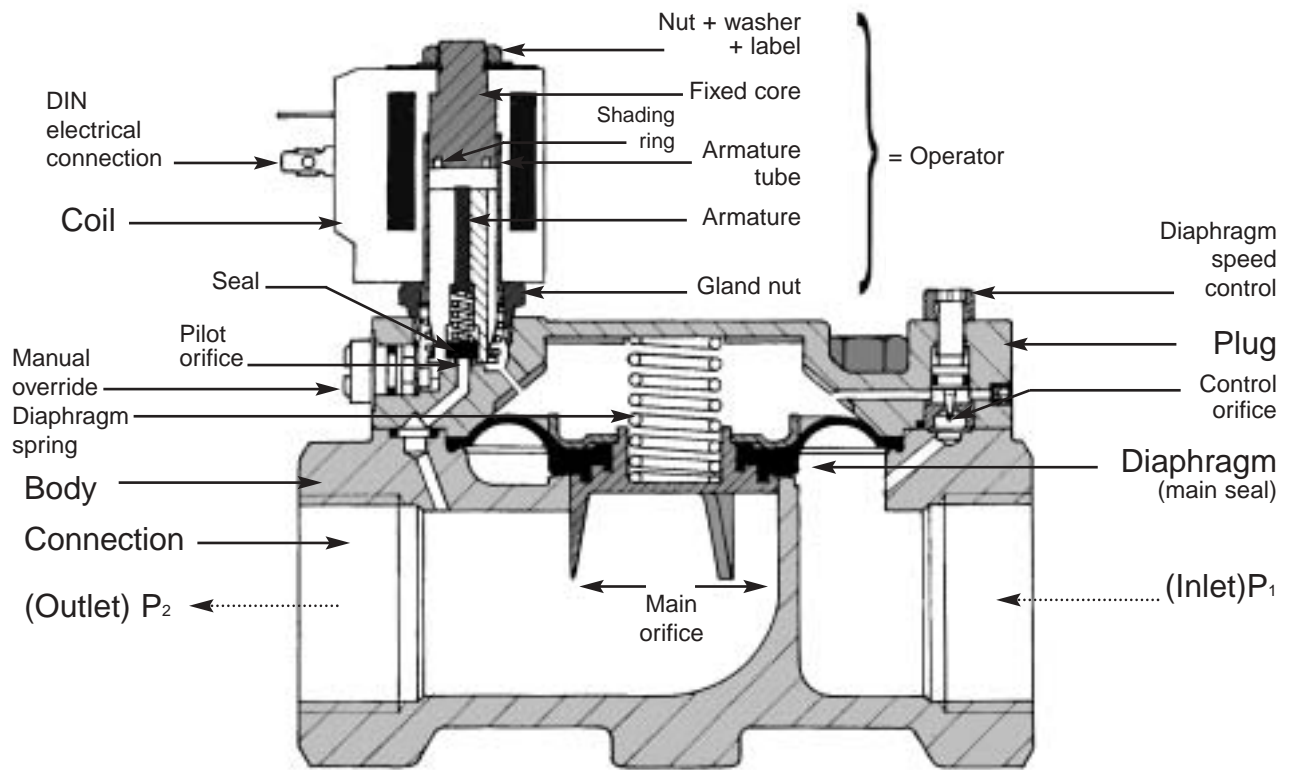
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## M&M INTERNATIONAL SOLENOID VALVES

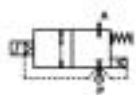
Scheme of components of M&M International solenoid valves



### Benefits of M&M International solenoid valves

Robust construction for industrial use Stainless steel orifice	→	High reliability Long life
Stainless steel operators with low residual magnetism according to DIN 1.4105 and AISI 430F	→	Corrosion resistance High performance
High quality seal materials NBR, FKM, EPDM, PTFE, Sigodur (filled PTFE), Ruby	→	Maximum compatibility with fluids
Fully interchangeable coils with a wide range of AC and DC voltages	→	High flexibility with reduced stock
Coils orientability at 360°	→	Easy and quick installation
Coils tested 100% in compliance with the current EC directives. Compliance to RoHS directive and to relevant international standards on request	→	CE UL ATEX
Development and execution of special projects	→	Customer oriented solutions

## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 1/4" ÷ G 1"



normally closed

TYPE: B203/204/205/206/222

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +90°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Operator seal material: NBR

Seal and Diaphragm material: NBR

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)

### OPTIONS

Normally open (Ex. code RB206DBY)

Manual override (Ex. code B204DBZM)

Speed control screw (only for B206DBYV and B222DBYV)

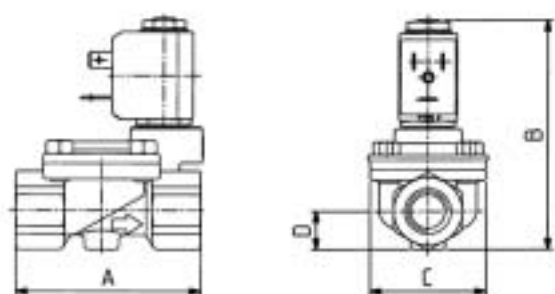
EPDM seal for air and hot water MAX 120°C (Ex. code B204DEZ)

FKM seal for air, water, oil MAX 130°C (Ex. code B204DVZ)

Version with operator ø 14,5 and coil type 7000 available on request (Ex. code D205DBZ)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	AC [bar]	DC [bar]	Code
	B203DBZ	1/4"	13	26	0.3		16	16	2250
	B204DBZ	3/8"	13	55	0.3		16	16	2200
	B205DBZ	1/2"	13	63	0.3		16	16	2400
	B206DBX compact	3/4"	21	90	0.3		16	16	2600
	B206DBY	3/4"	25	140	0.3		16	16	2700
	B222DBY	1"	25	216	0.3		16	16	

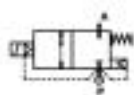


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	67	90	44	15	0.4
3/8"	67	90	44	15	0.4
1/2"	67	90	44	15	0.4
3/4" compact	82	105	50	20.25	0.6
3/4"	96	115	70	23	1.2
1"	96	115	70	23	1.2



## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 1 1/4" ÷ G 2"



normally closed

TYPE: D223/224/225

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +90°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Operator seal material: NBR

Seal and diaphragm material: NBR

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

Speed control screw as standard



### OPTIONS

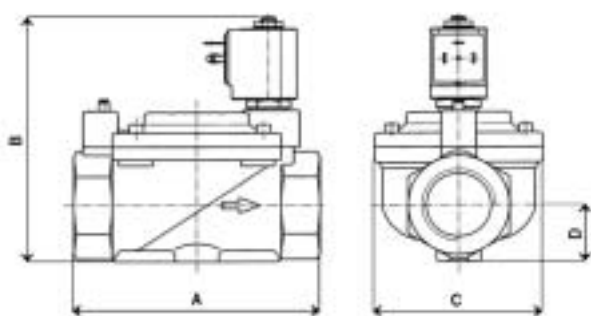
Normally open (Ex. code RD224DBK) with coils class "H" only

Manual override (Ex. code D223DBKM)

EPDM seal for air and hot water MAX 120°C (Ex. code D223DEK)

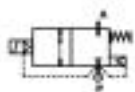
FKM seal for air, water, oil MAX 130°C (Ex. code D223DVK)

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	Code	[Volts/Hz]
	D223DBK	1 1/4"	40	370	0.5	16	7250	24V DC
	D224DBK	1 1/2"	40	400	0.5	16	7200	24V 50/60Hz
	D225DBJ	2"	50	540	0.5	16	7400	110V 50Hz - 120V 60Hz
							7600	200V 50Hz - 220V 60Hz
							7700	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1 1/4"	140	140	96	31	2.8
	1 1/2"	140	140	96	31	2.8
	2"	168	158	112	39	3.9

## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 3/8" ÷ G 3/4", HIGH PRESSURE



normally closed

TYPE: D232/233/234

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Operator seal material: Ruby

Diaphragm material: FKM

Main seal material: PTFE

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



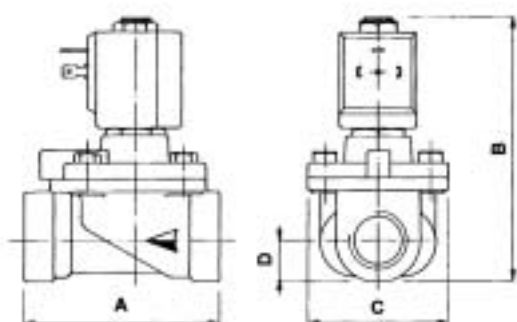
### OPTIONS

Normally open (Ex. code RD232DTW) with coils class "H" only

FKM main seal for air, water, oil MAX 130°C (Ex. code D233DYW)

MAX OPD: 25 bar AC / DC

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	Code	[Volts/Hz]
	D232DTW	3/8"	15.5	31	1	50	7250	24V DC
	D233DTW	1/2"	15.5	35	1	50	7200	24V 50/60Hz
	D234DTW	3/4"	15.5	37	1	50	7400	110V 50Hz - 120V 60Hz
							7600	200V 50Hz - 220V 60Hz
							7700	230V 50Hz - 240V 60Hz

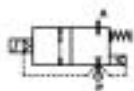


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
3/8"	86	115	50	17.5	0.9
1/2"	86	115	50	17.5	0.9
3/4"	86	115	50	17.5	0.9



## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 1/4" ÷ G 1/2"



normally closed

TYPE: D264/265/266

### TECHNICAL SPECIFICATIONS

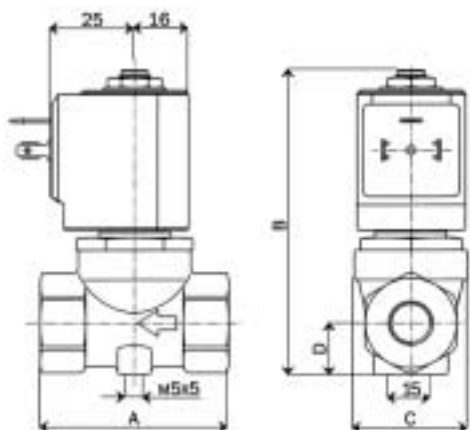
Media:	water, oil, air
Media temperature:	-10°C ÷ +90°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	brass (CW617N EN 12165)
Operator material:	stainless steel
Operator seal material:	NBR
Diaphragm material:	NBR
Coil power:	AC 18VA (holding) AC 36VA (inrush) DC 14W
Protection class:	IP 65 (with connector)

### OPTIONS

FKM seal for air, water, oil MAX 130°C (Ex. code D266DVU)  
EPDM seal for air and hot water MAX 120°C (Ex. code D266DEU)



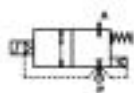
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D264DBU	1/4"	10.5	21	0.1	16	7	7250	24V DC
	D265DBU	3/8"	10.5	24	0.1	16	7	7200	24V 50/60Hz
	D266DBU	1/2"	10.5	25	0.1	16	7	7400	110V 50Hz - 120V 60Hz
								7600	200V 50Hz - 220V 60Hz
								7700	230V 50Hz - 240V 60Hz



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	54	89	34	15.5	0.4
3/8"	54	89	34	15.5	0.4
1/2"	54	89	34	15.5	0.4

## 2/2 WAY PILOT OPERATED VALVE WITH ASSISTED LIFT, G 1/4" ÷ G 1/2"



normally closed

TYPE: D884/885/886

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Operator seal material: FKM

Seal and Diaphragm material: FKM

Coil power: AC 18VA (holding)

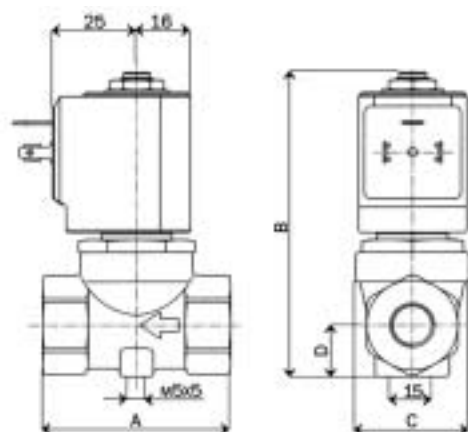
AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



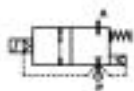
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	AC [bar]	DC [bar]	Code
	D884DVU	1/4"	10.5	21	0		16	6	7250
	D885DVU	3/8"	10.5	24	0		16	6	7200
	D886DVU	1/2"	10.5	25	0		16	6	7400
									7600
									7700



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	54	89	34	15.5	0.4
3/8"	54	89	34	15.5	0.4
1/2"	54	89	34	15.5	0.4

## 2/2 WAY PILOT OPERATED VALVE WITH ASSISTED LIFT, G 1/4" ÷ G 1"



normally closed

TYPE: D187/188/189/190/192/293

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +90°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Operator seal material: FKM

Seal and diaphragm material: NBR

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

### OPTIONS

EPDM seal for air and hot water MAX 120°C (Ex. code D188DEW)

FKM seal for air, water, oil MAX 130°C (Ex. code D187DVW)

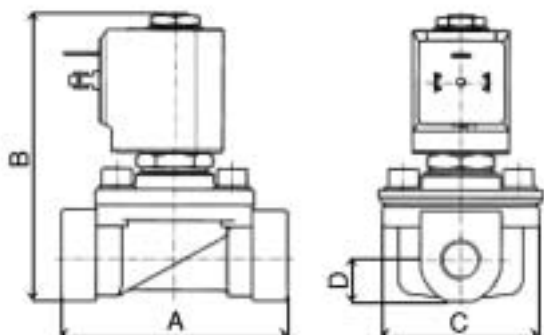
• DC MAX 6 bar x D187÷192 (Ex. code C D187DBW)

• DC MAX 5 bar x D293 (Ex. code C D293DBY)

<sup>(\*)</sup> Speed control screw as standard for type "D293"



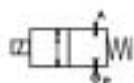
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D187DBW	1/4"	15	50	0	16	•	7250	24V DC
	D188DBW	3/8"	15	60	0	16	•	7200	24V 50/60Hz
	D189DBW	1/2"	15	65	0	16	•	7400	110V 50Hz - 120V 60Hz
	D190DBW	3/4"	15	80	0	16	•	7600	200V 50Hz - 220V 60Hz
	D192DBW compact	1"	15	85	0	16	•	7700	230V 50Hz - 240V 60Hz
	D293DBY <sup>(*)</sup>	1"	25	140	0	16	•		



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	75	108	53	14	0.5
3/8"	75	108	53	14	0.5
1/2"	75	108	53	14	0.5
3/4"	85	108	52	21.5	0.8
1" compact	85	108	52	21.5	0.7
1"	100	113	68	21.5	1.2

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8"



normally closed

TYPE: B297

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW719R EN 12165) low lead content

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: foodgrade FKM A80

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)



### OPTIONS

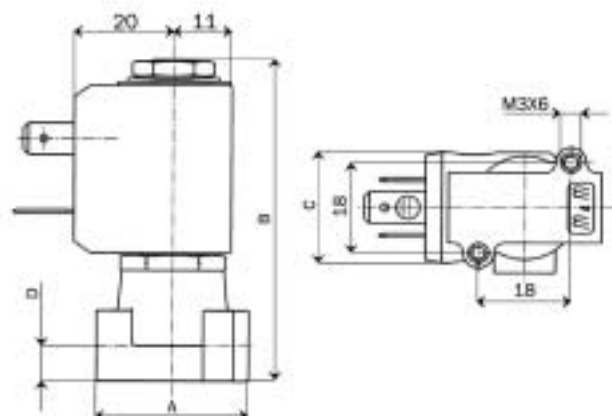
Normally open (Ex. code RB297DVC)

Manual override (Ex. code B297DVCM)

EPDM seal for air and hot water MAX  $120^{\circ}\text{C}$  (Ex. code B297DEC)

NPT connection on request (Ex. code B297DVEN)

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	AC [bar]	DC [bar]	Code
	B297DVB	1/8"	1.2	0.7	0		20	18	2250
	B297DVC	1/8"	1.5	1.0	0		18	15	2200
	B297DVE	1/8"	2.0	1.9	0		12	9	2400
	B297DVG	1/8"	2.5	2.7	0		5	2.5	2600
	B297DVH	1/8"	3.0	3.5	0		3	1	2700

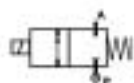


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	30	64	22	7	0.15

Flow direction overseat 1→2

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: D262/263

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

### OPTIONS

Normally open (Ex. code RD263DVG) with coils class "H" only

Manual override (Ex. code D262DVHM)

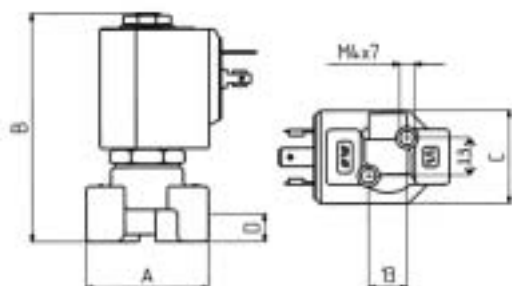
EPDM seal for air and hot water MAX 120°C (Ex. code D262DEH)

RUBY seal -10°C +180°C for high temperature with class "H" coils  
(Ex. code D262DRC 7201)



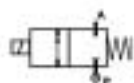
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D262DVA	1/8"	1.0	0.5	0	30	30	7250	24V DC
	D262DVC	1/8"	1.5	1.3	0	24	24	7200	24V 50/60Hz
	D262DVG	1/8"	2.5	3.4	0	18	16	7400	110V 50Hz - 120V 60Hz
	D262DVH	1/8"	3.0	4.5	0	15	8	7600	200V 50Hz - 220V 60Hz
	D263DVC	1/4"	1.5	1.3	0	24	24	7700	230V 50Hz - 240V 60Hz
	D263DVG	1/4"	2.5	3.4	0	18	16		
	D263DVH	1/4"	3.0	4.5	0	15	8		
	D263DVL*	1/4"	4.0	6.0	0	8	5		
	D263DVN*	1/4"	5.0	7.5	0	5	2.5		
	D263DVP*	1/4"	6.0	8.5	0	3	1		

\* NO version not available



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	40	77.5	32	11	0.26
	1/4"	40	77.5	32	11	0.26

## 2/2 WAY DIRECT ACTING SOLENOID VALVE with hose tail



normally closed

TYPE: 244

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 12VA (holding)

AC 24VA (inrush)

DC 10W

Protection class: IP 65 (with connector)

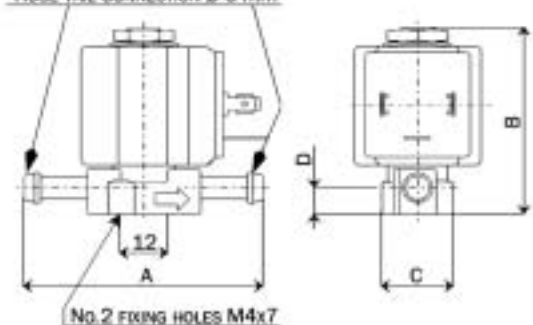


### OPTIONS

NBR seal for air, water, oil MAX  $90^{\circ}\text{C}$  (Ex. code 244DBF)

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	244DVF	-	2.2	2	0	AC [bar]	DC [bar]	8250	24V DC
								8200	24V 50/60Hz
								8400	110V 50/60Hz
								8700	230V 50Hz – 240V 60Hz

HOSE TAIL CONNECTION Ø 6 mm

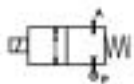


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
-	61.5	50	19	7	0.19



## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: 248/249

### TECHNICAL SPECIFICATIONS

Media:	water, oil, air
Media temperature:	-10°C ÷ +130°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	brass (CW617N EN 12165)
Operator material:	stainless steel
Seal material:	FKM
Coil power:	AC 12VA (holding) AC 24VA (inrush) DC 10W
Protection class:	IP 65 (with connector)

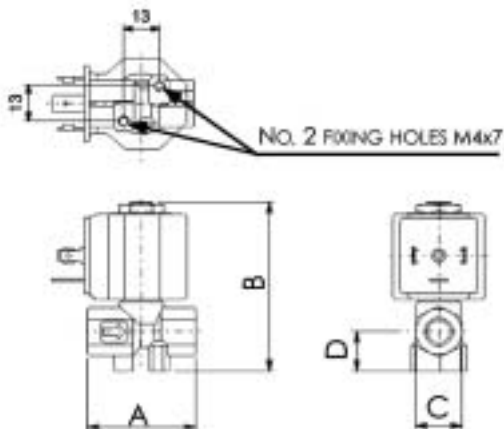
### OPTIONS

EPDM seal for air and hot water MAX 120°C (Ex. code 248DEF)



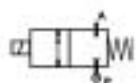
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD*			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	248DVD	1/8"	1.7	1.5	0	25	20	8250	24V DC
	248DVF	1/8"	2.2	2.4	0	18	13	8200	24V 50/60Hz
	248DVH	1/8"	3.0	4	0	12	7	8400	110V 50Hz - 120V 60Hz
	249DVD	1/4"	1.7	1.5	0	25	20	8700	230V 50Hz - 240V 60Hz
	249DVF	1/4"	2.2	2.4	0	18	13		
	249DVH	1/4"	3.0	4.5	0	12	7		
	249DVL	1/4"	4.0	6	0	4	1.5		

\* OPD rating valid since april 2007



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	38	62.5	CH 17	14.5	0.19
	1/4"	38	62.5	CH 17	14.5	0.18

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/4" ÷ G 1/2"



normally closed

TYPE: D237/238/239

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Pilot material: stainless steel

Seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

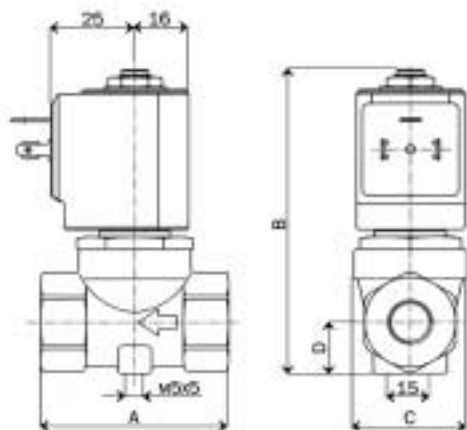
### OPTIONS

EPDM seal for air and hot water MAX 120°C (Ex. code D239DEU)

NBR seal for air, water, oil MAX 90°C (Ex. code D237DBU)



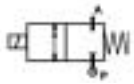
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	Code	[Volts/Hz]
	D237DVU	1/4"	10.5	21	0	0.4	7250	24V DC
	D238DVL	3/8"	4.0	6.0	0	8	7200	24V 50/60Hz
	D238DVN	3/8"	5.0	7.5	0	5	7400	110V 50Hz - 120V 60Hz
	D238DVP	3/8"	6.0	8.5	0	3.5	7600	200V 50Hz - 220V 60Hz
	D238DVU	3/8"	10.5	24	0	0.4	7700	230V 50Hz - 240V 60Hz
	D239DVU	1/2"	10.5	25	0	0.4		



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	54	89	39	15.5	0.4
3/8"	54	89	39	15.5	0.4
1/2"	54	89	39	15.5	0.4

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8"



normally closed

TYPE: B298

### TECHNICAL SPECIFICATIONS

Media: water, oil, air, aggressive fluids

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: stainless steel (AISI 303 EN 10088-3)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: foodgrade FKM A80

Coil power: AC 10VA (holding)

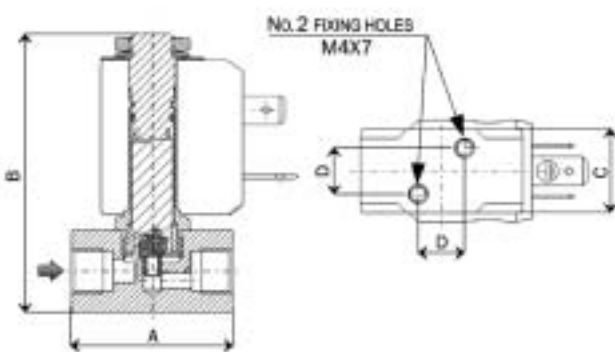
AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)

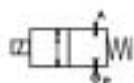


SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	B298DV3	1/8"	1.5	1.0	0	18	15	2250	24V DC
	B298DV5	1/8"	2.0	1.9	0	12	9	2200	24V 50/60Hz
	B298DV7	1/8"	2.5	2.7	0	8	3	2400	110V 50Hz - 120V 60Hz
	B298DV8	1/8"	3.0	3.5	0	3	1	2600	200V 50Hz - 220V 60Hz
								2700	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	35	60.6	18	10	0.1

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: D298/299

### TECHNICAL SPECIFICATIONS

Media: water, oil, air, aggressive fluids

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: stainless steel (AISI 303 EN 10088-3)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



### OPTIONS

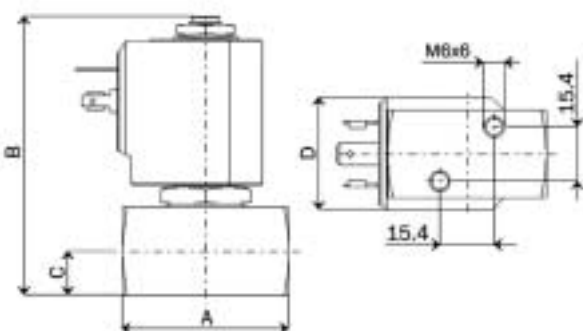
Normally open (Ex. code RD298DVG) with coils class "H" only

Silver shading ring (Ex. code D298DVCA)

EPDM seal for air and hot water MAX 120°C (Ex. code D299DEG)

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D298DVC	1/8"	1.5	1.3	0	24	24	7250	24V DC
	D298DVG	1/8"	2.5	3.4	0	18	16	7200	24V 50/60Hz
	D298DVH	1/8"	3.0	4.5	0	15	8	7400	110V 50Hz - 120V 60Hz
	D299DVC	1/4"	1.5	1.3	0	24	24	7600	200V 50Hz - 220V 60Hz
	D299DVG	1/4"	2.5	3.4	0	18	16	7700	230V 50Hz - 240V 60Hz
	D299DVH	1/4"	3.0	4.5	0	15	8		
	D299DVL*	1/4"	4.0	6.0	0	8	5		
	D299DVN*	1/4"	5.0	7.5	0	5	2		

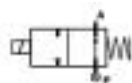
\* NO version not available



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	44	78.5	12.5	32	0.36
1/4"	44	78.5	12.5	32	0.36

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G1/4"



normally open

TYPE: RD236

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Main seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

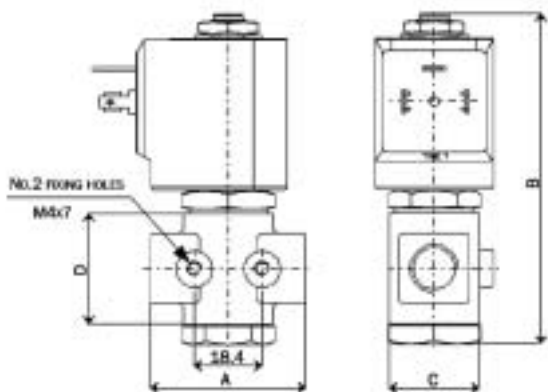
### OPTIONS

EPDM seal for air and hot water MAX 120°C (Ex. code RD236DEC)

RUBY seal -10°C +180°C for high temperature with class "H" coils  
(Ex. code RD236DRH 7201)



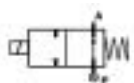
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	Code	[Volts/Hz]
	RD236DVA	1/4"	1.0	0.5	0	30	7250	24V DC
	RD236DVC	1/4"	1.5	1.3	0	20	7200	24V 50/60Hz
	RD236DVG	1/4"	2.5	2.8	0	15	7400	110V 50Hz - 120V 60Hz
	RD236DVH	1/4"	3.0	3.5	0	12	7600	200V 50Hz - 220V 60Hz
	RD236DVM	1/4"	4.5	5.5	0	5	7700	230V 50Hz - 240V 60Hz



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	42	89	24.5	30.3	0.25

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8"



normally open

TYPE: RB214

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Main seal material: foodgrade FKM A80

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)

### OPTIONS

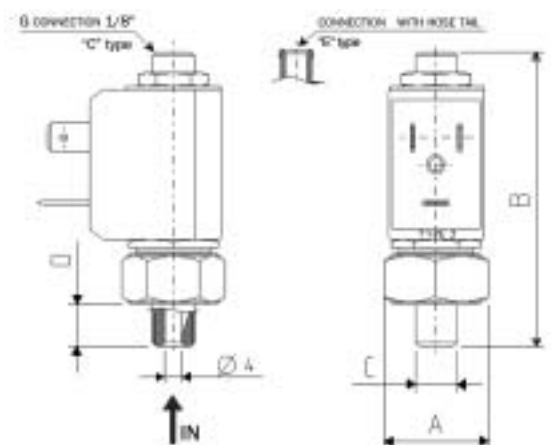
EPDM seal for air and hot water MAX  $120^{\circ}\text{C}$  (Ex. code RB214CED)

Armature tube with hose tail  $\varnothing 6 \text{ mm}$  (Ex. code RB214EVD)

Electroless nickel plating treatment (Ex. code RB214CVDK)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
					min	max		
	Codice	[ISO 228]	[mm]	[l/min]	[bar]	CA [bar]	CC [bar]	Codice
	RB214CVD	1/8"	1.7	1.2	0	14	14	[Volts/Hz]
								2250 24V CC
								2200 24V 50/60Hz
								2400 110V 50Hz - 120V 60Hz
								2600 200V 50Hz - 220V 60Hz
								2700 230V 50Hz - 240V 60Hz

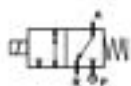


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	21	65.7	1/8"	9.5	-



## 3/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8"



normally closed

TYPE: B397

### TECHNICAL SPECIFICATIONS

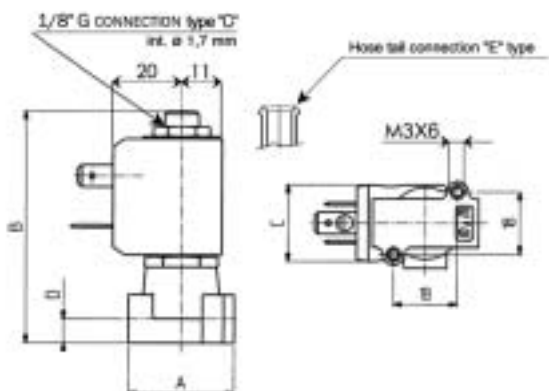
Media:	water, oil, air
Media temperature:	-10°C ÷ +130°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	brass (CW719R EN 12165) low lead content
Orifice material:	stainless steel (AISI 303 EN 10088-3)
Operator material:	stainless steel
Seal material:	foodgrade FKM A80
Coil power:	AC 10VA (holding) AC 16VA (inrush) DC 7W
Protection class:	IP 65 (with connector)

### OPTIONS

Normally open (Ex. code <u>RB397C</u> <u>VE</u> )
Manual override (Ex. code B397CV <u>B</u> <u>M</u> )
EPDM seal for air and hot water MAX 120°C (Ex. code B397C <u>E</u> <u>C</u> )
Armature tube with hose tail Ø 6 mm (Ex. code B397 <u>E</u> <u>V</u> )
Electroless nickel plating treatment (Ex. code B397CV <u>C</u> <u>K</u> )



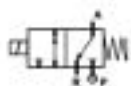
SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	B397CVA	1/8"	1.0	0.5	0	18	18	2250	24V DC
	B397CVB	1/8"	1.2	0.7	0	15	15	2200	24V 50/60Hz
	B397CVC	1/8"	1.5	1.0	0	10	10	2400	110V 50Hz - 120V 60Hz
	B397CVE	1/8"	2.0	1.9	0	5	5	2600	200V 50Hz - 220V 60Hz
	B397CVH	1/8"	3.0	3.5	0	2	2	2700	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	30	67	22	7	0.15

Flow direction underseat 2→1

## 3/2 WAY DIRECT ACTING SOLENOID VALVE, FLANGE 32X32



normally closed

TYPE: D301

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



### OPTIONS

Normally open (Ex. code RD301CVC) with coils class "H" only

Manual override (Ex. code D301AVCM)

EPDM seal for air and hot water MAX  $120^{\circ}\text{C}$  (Ex. code D301CEC)

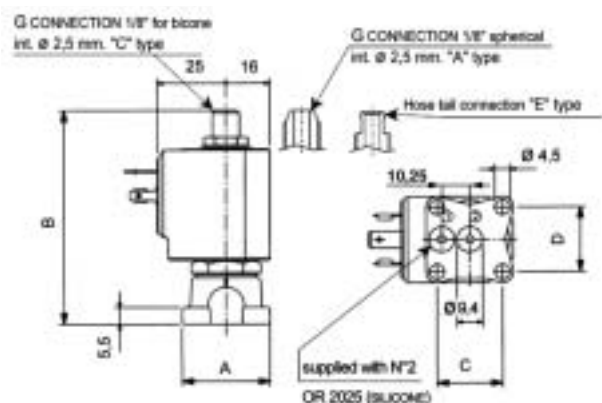
RUBY seal  $-10^{\circ}\text{C} +180^{\circ}\text{C}$  for high temperature with class "H" coils

(Ex. code D301ARB 7201)

Armature tube with G connection 1/8" spherical (Ex. code D301AVC)

Armature tube with hose tail  $\varnothing 6 \text{ mm}$  (Ex. code D301EVE)

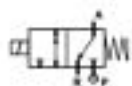
SELECTION TABLE	VALVE	Square base	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D301CVC	32x32	1.5	1.3	0	18	18	7250	24V DC
	D301CVE	32x32	2.0	2.2	0	10	10	7200	24V 50/60Hz
	D301CVG	32x32	2.5	3.4	0	7	7	7400	110V 50Hz - 120V 60Hz
								7600	200V 50Hz – 220V 60Hz
								7700	230V 50Hz – 240V 60Hz



### DIMENSIONS & WEIGHTS

square base	A	B	C	D	weight
[mm]	[mm]	[mm]	[mm]	[mm]	[Kg]
32x32	32	77	24	24	0.25

## 3/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: D362/363

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



### OPTIONS

Normally open (Ex. code RD362CVC) with coils class "H" only

Manual override (Ex. code D362CVGM)

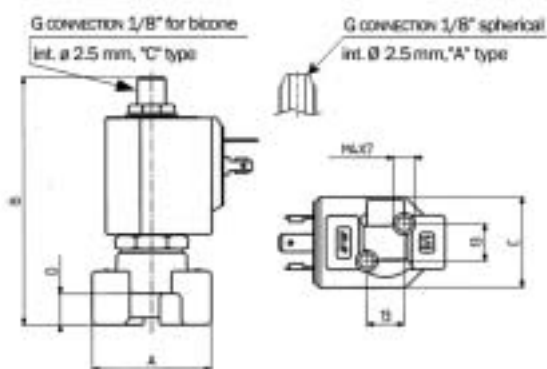
EPDM seal for air and hot water MAX 120°C (Ex. code D362CEC)

RUBY seal -10°C+180°C for high temperature with class "H" coils  
(Ex. code D363ARE 7201)

Armature tube with G connection 1/8" spherical (Ex. code D362AVC)

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D362CVC	1/8"	1.5	1.3	0	18	18	7250	24V DC
	D362CVE	1/8"	2.0	2.2	0	10	10	7200	24V 50/60Hz
	D362CVG	1/8"	2.5	3.4	0	7	7	7400	110V 50Hz - 120V 60Hz
	D363CVC	1/4"	1.5	1.3	0	18	18	7600	200V 50Hz - 220V 60Hz
	D363CVE	1/4"	2.0	2.2	0	10	10	7700	230V 50Hz - 240V 60Hz
	D363CVG	1/4"	2.5	3.4	0	7	7		
	D363CVH	1/4"	3.0	4.5	0	5	5		
	D363CVL*	1/4"	4.0	6.0	0	3.5	3.5		
	D363CVN*	1/4"	5.0	7.5	0	2.5	2.5		
	D363CVP*	1/4"	6.0	8.5	0	1.5	1.5		

\* NO version not available

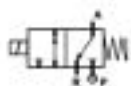


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	40	87	32	11	0.25
1/4"	40	87	32	11	0.25

Flow direction underseat 2→1

## 3/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8"



normally closed

TYPE: B398

### TECHNICAL SPECIFICATIONS

Media: water, oil, air, aggressive fluids

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: stainless steel (AISI 303 EN 10088-3)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: foodgrade FKM A80

Coil power: AC 10VA (holding)

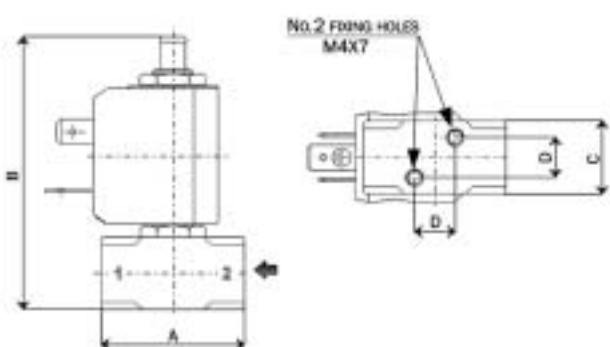
AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)

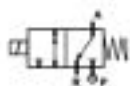


SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	B398EV2	1/8"	1.2	0.7	0	15	15	2250	24V DC
	B398EV3	1/8"	1.5	1.0	0	10	10	2200	24V 50/60Hz
	B398EV5	1/8"	2.0	1.9	0	5	5	2400	110V 50Hz - 120V 60Hz
	B398EV7	1/8"	2.5	2.7	0	3	3	2600	200V 50Hz - 220V 60Hz
								2700	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	35	68	18	10	0.1

## 3/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: D398/399

### TECHNICAL SPECIFICATIONS

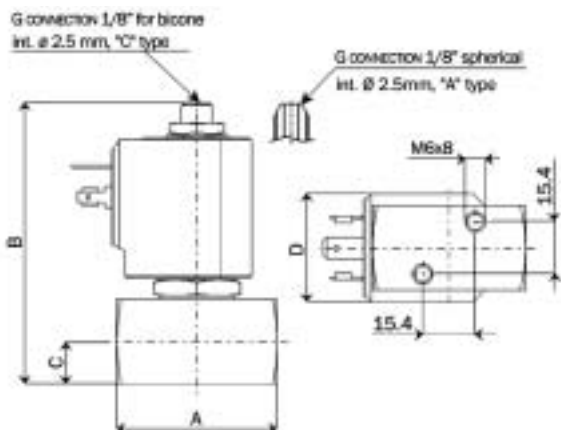
Media:	aggressive fluids
Media temperature:	-10°C ÷ +130°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	stainless steel (AISI 303 EN 10088-3)
Orifice material:	stainless steel (AISI 303 EN 10088-3)
Operator material:	stainless steel
Seal material:	FKM
Coil power:	AC 18VA (holding) AC 36VA (inrush) DC 14W
Protection class:	IP 65 (with connector)

### OPTIONS

Normally open (Ex. code RD399CVH) with coils class "H" only  
 EPDM seal for air and hot water MAX 120°C (Ex. code D398CEG)  
 Armature tube with G connection 1/8" spherical (Ex. code D398AVC)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D398CVC	1/8"	1.5	1.3	0	18	18	7250	24V DC
	D398CVE	1/8"	2.0	2.2	0	10	10	7200	24V 50/60Hz
	D398CVG	1/8"	2.5	3.4	0	7	7	7400	110V 50Hz - 120V 60Hz
	D399CVC	1/4"	1.5	1.3	0	18	18	7600	200V 50Hz - 220V 60Hz
	D399CVE	1/4"	2.0	2.2	0	10	10	7700	230V 50Hz - 240V 60Hz
	D399CVG	1/4"	2.5	3.4	0	7	7		
	D399CVH	1/4"	3.0	4.5	0	5	5		

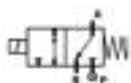


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	44	88	12.5	32	0.35
1/4"	44	88	12.5	32	0.35

Flow direction underseat 2→1

## 3/2 WAY DIRECT ACTING SOLENOID VALVE, FOR MANIFOLDING G 1/8"



normally closed

TYPE: B919/920/921

### TECHNICAL SPECIFICATIONS

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: FKM

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 7W

Protection class: IP 65 (with connector)

Standard manual override



### OPTIONS

Normally open (Ex. code RB919CVC)

Assembly plug with silicone O-RING code 883 026 000

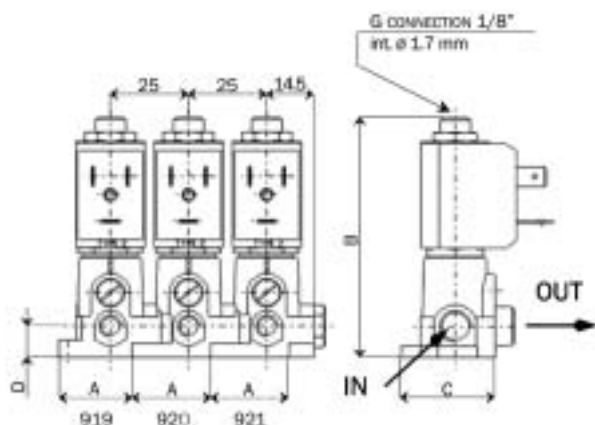
Version 2/2 ways w/o manual override (Ex. code B919DVC)

Pre-assembled manifolds with max 4 valves will be delivered on request

### OPTION 2/2 WAY



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	B919CVCM	1/8"	1.5	1.0	0	10	10	2250	24V DC
	B920CVCM	1/8"	1.5	1.0	0	10	10	2200	24V 50/60Hz
	B921CVCM	1/8"	1.5	1.0	0	10	10	2400	110V 50Hz - 120V 60Hz
								2600	200V 50Hz - 220V 60Hz
								2700	230V 50Hz - 240V 60Hz



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/8"	26	76	34.5	9.5	0.18



## MISCELLANEOUS

TYPE: **MANIFOLD**

EXAMPLE: NO. 3 X 2/2 WAY DIRECT ACTING NC

Customized solutions for various fluid control applications.

**TECHNICAL SPECIFICATIONS:** according to customer's request



TYPE: **B296DVC**

2/2 WAY DIRECT ACTING NC

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Connection: male connection G 1/8" and hose tail  $\varnothing$  6 mm

Operating pressure: AC  $0 \div 18$  bar / DC  $0 \div 15$  bar

Body material: brass (CW617N EN 12165)

Seal material: FKM

**TECHNICAL SPECIFICATIONS:** see "B297" page 10



TYPE: **B294DVC**

2/2 WAY DIRECT ACTING NC

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Square base connection: flange 25X25

Operating pressure: AC  $0 \div 18$  bar / DC  $0 \div 15$  bar

Body material: brass (CW617N EN 12165)

Seal material: FKM

**TECHNICAL SPECIFICATIONS:** see "B297" page 10



TYPE: **B394CVC**

3/2 WAY DIRECT ACTING NC

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Square base connection: flange 25X25

Operating pressure: AC and DC  $0 \div 10$  bar

Body material: brass (CW617N EN 12165)

Seal material: FKM

**TECHNICAL SPECIFICATIONS:** see "B397" page 19



TYPE: **RB216EVC**

2/2 WAY DIRECT ACTING NO

Media: water, oil, air

Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$

Connection: IN  $\rightarrow$  female G 1/8" - OUT  $\rightarrow$  hose tail  $\varnothing$  6 mm

Operating pressure: AC and DC  $0 \div 14$  bar

Body material: brass (CW617N EN 12165)

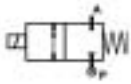
Seal material: FKM

**TECHNICAL SPECIFICATIONS:** see "RB214" page 18



## 2/2 WAY DIRECT ACTING "DRY ARMATURE" SOLENOID VALVE

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



normally closed

TYPE: D208

### TECHNICAL SPECIFICATIONS

Media: water and beverages

Media temperature:  $-10^{\circ}\text{C} \div +95^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: Natural Polysulphone UDEL P-1700 Natural 11

Operator material: stainless steel

Seal material: silicone

Coil power: AC 18VA (holding)

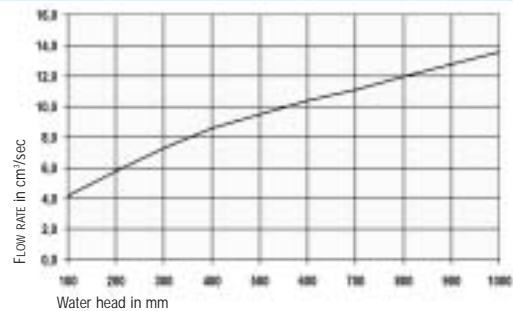
AC 36VA (inrush)

DC 14W

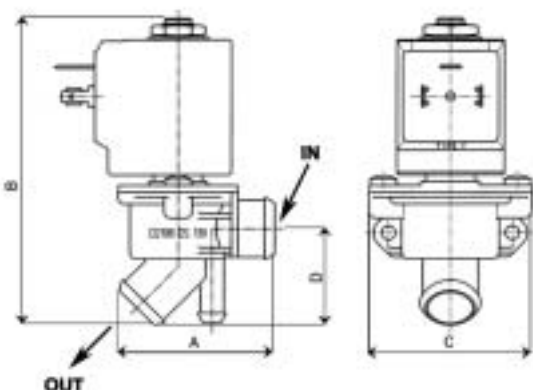
Protection class: IP 65 (with connector)



### FLOW RATE CHART\*



SELECTION TABLE	VALVE	INLET fitting	OUTLET fitting	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[mm]	[mm]	[mm]	[l/min]	min	max	Code	[Volts/Hz]
	D208DSZ	Ø 17.5	Ø 16.5	13	*	0	0.1	7250	24V DC
	C D208DSZ	Ø 17.5	Ø 16.5	13	*	0	- 0.1	7200	24V 50/60Hz
								7400	110V 50Hz - 120V 60Hz
								7600	200V 50Hz - 220V 60Hz
								7700	230V 50Hz - 240V 60Hz

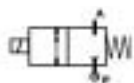


### DIMENSIONS & WEIGHTS

VALVE TYPE	A	B	C	D	weight
Code	[mm]	[mm]	[mm]	[mm]	[Kg]
D208DSZ	47	112.5	48.5	28.8	0.125
C D208DSZ	47	112.5	48.5	28.8	0.125

## 2/2 WAY DIRECT ACTING "DRY ARMATURE" SOLENOID VALVE, G 3/8"

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



normally closed

TYPE: D211

### TECHNICAL SPECIFICATIONS

Media: water and beverages

Media temperature:  $-10^{\circ}\text{C} \div +95^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Seal material: silicone

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

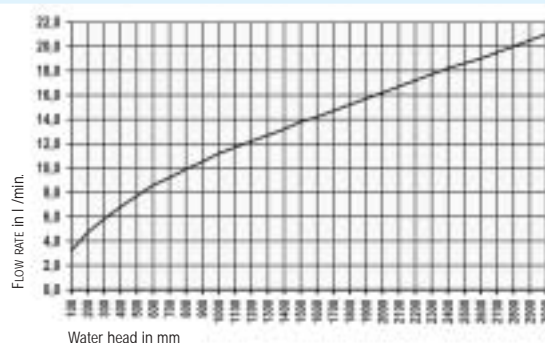
Protection class: IP 65 (with connector)



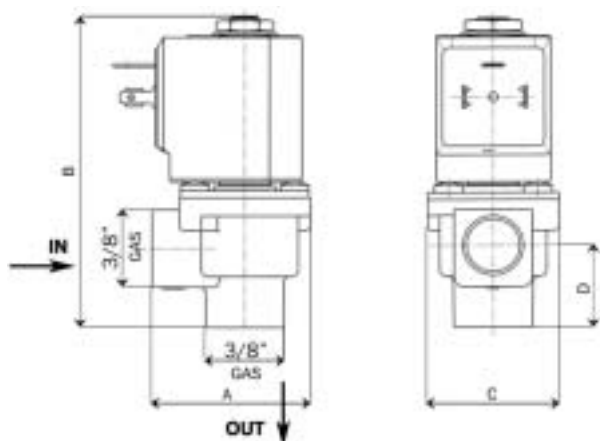
### OPTIONS

Electroless nickel plating treatment (Ex. code D211DSUK)

### FLOW RATE CHART\*



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D211DSU	3/8"	11	*	0	0.3	-	7250	24V DC
	C D211DSU	3/8"	11	*	0	-	0.2	7200	24V 50/60Hz
								7400	110V 50Hz - 120V 60Hz
								7600	200V 50Hz - 220V 60Hz
								7700	230V 50Hz - 240V 60Hz

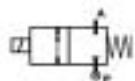


### DIMENSIONS & WEIGHTS

VALVE TYPE	A	B	C	D	weight
Code	[mm]	[mm]	[mm]	[mm]	[Kg]
D211DSU	43.4	86	36	22	0.340
C D211DSU	43.4	86	36	22	0.340

## 2/2 WAY DIRECT ACTING "DRY ARMATURE" SOLENOID VALVE

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



**normally closed**

**TYPE: 246**

### TECHNICAL SPECIFICATIONS

Media: water, food and beverages

Media temperature: -10°C ÷ +95°C

Ambient temperature: -10°C ÷ +50°C

Body material: 246DSR brass (CW617N EN 12165)

246DSQ natural hostaform (C13021)

Operator material: stainless steel

Seal material: silicone

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 10W

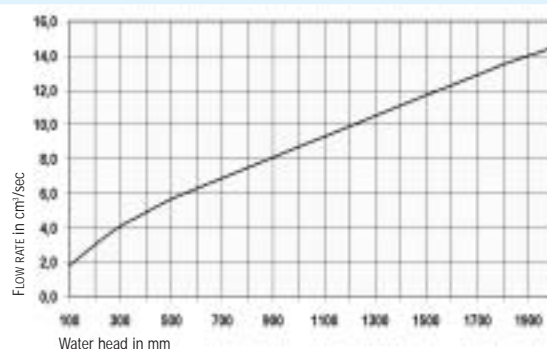
Protection class: IP 65 (with connector)

Length of the vent pipe: 85 mm

Standard flow regulation screw



### FLOW RATE CHART



### OPTIONS

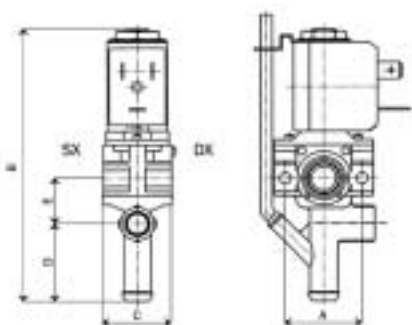
Brass body with electroless nickel plating treatment

(Ex. code 246DSKOE)

Brass fittings available on request

### SELECTION TABLE

VALVE	Left Hole	Righth Hole	Nominal Diameter	OPD max			COILS	
				min				
Code	-	-	[mm]	[bar]	AC	DC	Code	[Volts/Hz]
246DSRDE	fast connection	cap	8.0	0	0.2	0.1	22V0	24V DC
246DSRED	cap	fast connection					2200	24V 50/60Hz
246DSREP	cap	hose tail					2400	110V 50Hz - 120V 60Hz
246DSRE0	cap	1/4" threaded					2600	200V 50Hz - 220V 60Hz
246DSR0E	1/4" threaded	cap					2700	230V 50Hz - 240V 60Hz
246DSR00	1/4" threaded	1/4" threaded						
246DSRPE	hose tail	cap						
246DSQAA	open without threads	open without threads	7.5					
246DSQDG	fast connection	closed						
246DSQGD	closed	fast connection						
246DSQG0	closed	1/4" threaded						
246DSQ0G	1/4" threaded	closed						
246DSQ00	1/4" threaded	1/4" threaded						

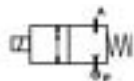


### DIMENSIONS & WEIGHTS

VALVE TYPE	A	B	C	D	E	weight
Code	[mm]	[mm]	[mm]	[mm]	[mm]	[Kg]
246DSR..	28	101	25	29	17	0.2
246DSQ..	28	101	25	29	17	0.125

## 2/2 WAY DIRECT ACTING "DRY ARMATURE" SOLENOID VALVE

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



**normally closed**

**TYPE: WB251**

### TECHNICAL SPECIFICATIONS

Media: water and beverages

Media temperature:  $-10^{\circ}\text{C} \div +95^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$

Body material: Natural Polysulphone UDEL P-1700 Natural 11

Operator material: stainless steel

Seal material: silicone

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 10W

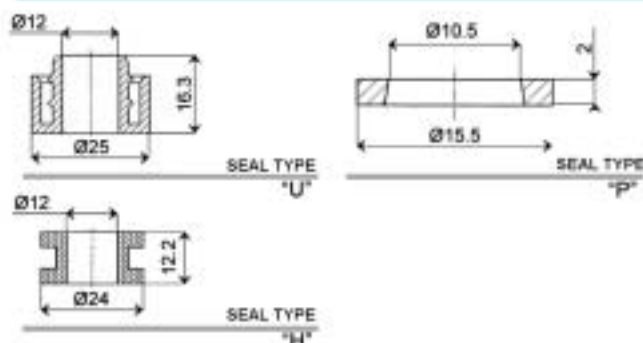
Protection class: IP 65 (with connector)

Nominal diameter: 9.0 mm

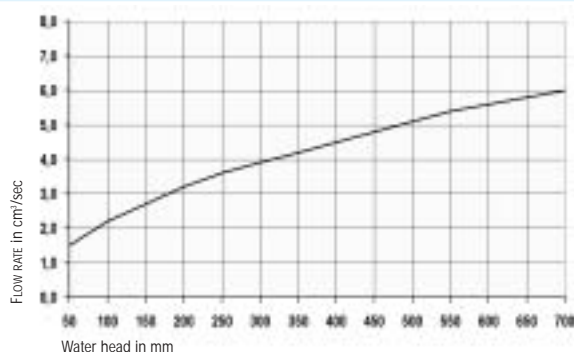
Standard flow regulation screw



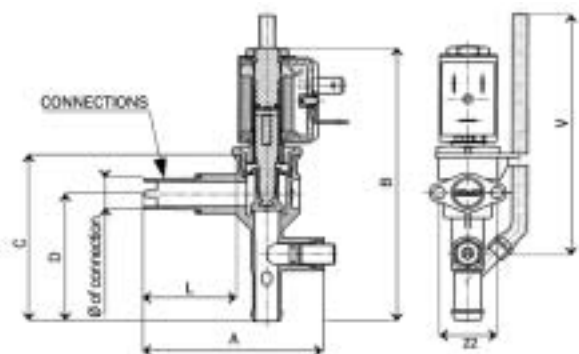
### OPTIONS



### FLOW RATE CHART



SELECTION TABLE	VALVE	Type of connection	Seal type	Length of the vent pipe (V)	OPD			COILS	
	Code	[mm]	-	[mm]	min [bar]	AC [bar]	max DC [bar]	Code	[Volts/Hz]
	WB251DSS	Ø 12 x L=35	"P"	95	0	0.07	0.05	22V0	24V DC
	WB251DSS1	Ø 12 x L=35	"P"	235				2200	24V 50/60Hz
	WB251DSS01	Ø 11 x L=25	"P"	95				2400	110V 50Hz - 120V 60Hz
	WB251DSSA1	Ø 12 x L=35	"U"	95				2600	200V 50Hz - 220V 60Hz
	WB251DSSA2	Ø 12 x L=48	"U"	95				2700	230V 50Hz - 240V 60Hz
	WB251DSSB1	Ø 12 x L=35	"H"	95					
	WB251DSSB2	Ø 12 x L=48	"H"	95					
	WB251DSS11	Ø 11 x L=15.2	"P"	95					
	WB251DSS12	Ø 11 x L=25	"P"	195					
	WB251DSS13	Ø 12 x L=48	"H"	215					
	WB251DSSVE	Ø 11 x L=10.5	"P"	95					



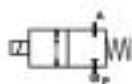
### DIMENSIONS & WEIGHTS

VALVE TYPE	A	B	C	D	weight
Code	[mm]	[mm]	[mm]	[mm]	[Kg]
WB251DSS/1	70	108	65.5	50.2	0.175
WB251DSS11	49.7	108	65.5	50.2	0.175
WB251DSS01/12	59.5	108	65.5	50.2	0.175
WB251DSSA2/B2/13	82.5	108	65.5	50.2	0.175
WB251DSSA1/B1	70	108	65.5	50.2	0.175
WB251DSSVE	45	108	65.5	50.2	0.175



## 2/2 WAY DIRECT ACTING "DRY ARMATURE" SOLENOID VALVE

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



normally closed

TYPE: WB253

### TECHNICAL SPECIFICATIONS

Media: water, food and beverages

Media temperature: -10°C ÷ +95°C

Ambient temperature: -10°C ÷ +50°C

Body material: Natural Polysulphone UDEL P-1700 Natural 11

Operator material: stainless steel

Seal material: silicone

Coil power: AC 10VA (holding)

AC 16VA (inrush)

DC 10W

Protection class: IP 65 (with connector)

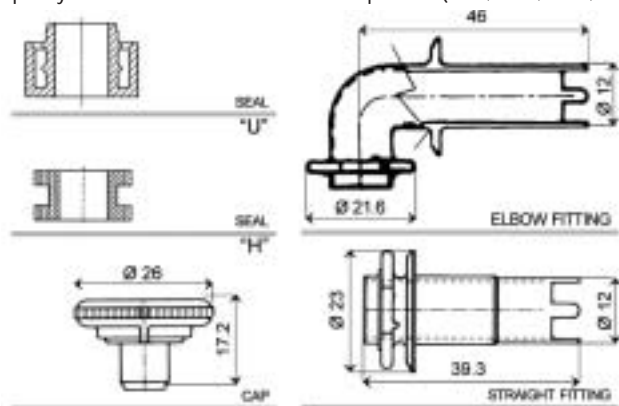
Nominal diameter: 9.0 mm

Standard flow regulation screw

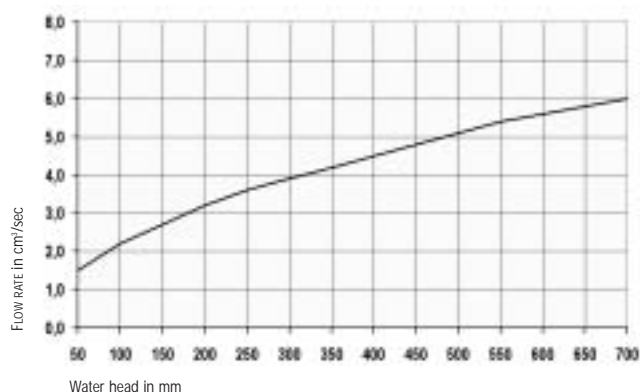


### OPTIONS

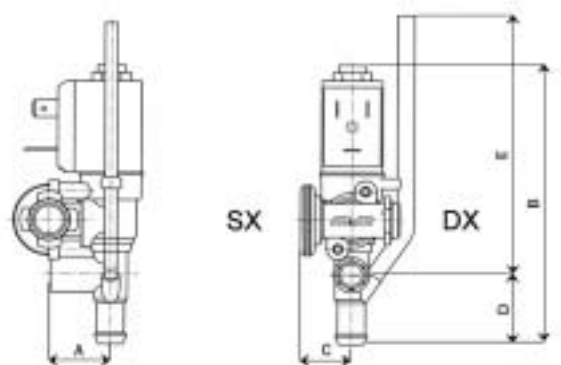
Specify in the code the No. of valves requested (B=2; C=3; D=4; E=5; F=6)



### FLOW RATE CHART



SELECTION TABLE	VALVE	Connection		Seal type	OPD			COILS	
	Code	[left]	[right]	-	min		max	Code	[Volts/Hz]
	WB25-DSRBD	CAP	STRAIGHT FITTING	"H"	0	AC [bar]	0.07	22V0	24V DC
	WB25-DSRBG	CAP	ELBOW FITTING	"H"				2200	24V 50/60Hz
	WB25-DSRCD	CAP	STRAIGHT FITTING	"U"				2400	110V 50Hz - 120V 60Hz
	WB25-DSRCG	CAP	ELBOW FITTING	"U"				2600	200V 50Hz - 220V 60Hz
	WB25-DSRDB	STRAIGHT FITTING	CAP	"H"				2700	230V 50Hz - 240V 60Hz
	WB25-DSRDC	STRAIGHT FITTING	CAP	"U"					
	WB25-DSRGC	ELBOW FITTING	CAP	"U"					
	WB25-DSRGB	ELBOW FITTING	CAP	"H"					

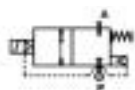


### DIMENSIONS & WEIGHTS

VALVE TYPE	A	B	C	D	E	weight
Code	[mm]	[mm]	[mm]	[mm]	[mm]	[Kg]
All type	22.5	104.5	18.5	25.6	130	0.125



## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 1/4" ÷ G 1"



normally closed

TYPE: D887/888/889/890/892

### TECHNICAL SPECIFICATIONS

Media: hot water, steam

Media temperature: -10°C ÷ +150°C

Ambient temperature: -10°C ÷ +70°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Operator seal material: EPM PX 70/80

Diaphragm material: PTFE

Main seal material: EPM PX 70/80

Coil power: AC 18VA (holding)

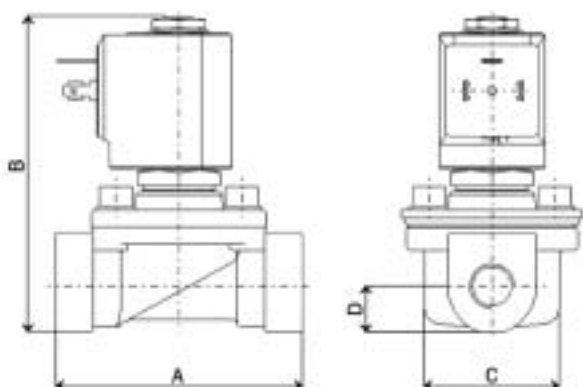
AC 36VA (inrush)

DC 22W

Protection class: IP 65 (with connector)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D887DPV	1/4"	11.5	35	0.3	4.5	4.5	7221	24V DC
	D888DPV	3/8"	11.5	50	0.3	4.5	4.5	7201	24V 50/60Hz
	D889DPV	1/2"	11.5	55	0.3	4.5	4.5	7401	110V 50Hz - 120V 60Hz
	D890DPV	3/4"	11.5	70	0.3	4.5	4.5	7601	200V 50Hz - 220V 60Hz
	D892DPV	1"	11.5	75	0.3	4.5	4.5	7701	230V 50Hz - 240V 60Hz

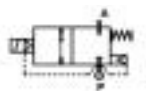


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	75	95	53	14	0.5
3/8"	75	95	53	14	0.5
1/2"	75	95	53	14	0.5
3/4"	85	105	53	22	0.8
1"	85	105	53	22	0.8

Flow direction overseat 1→2

## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 3/4" AND G 1"



normally closed

TYPE: D606/622

### TECHNICAL SPECIFICATIONS

Media: hot water, steam

Media temperature:  $+60^{\circ}\text{C} \div +180^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +70^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Diaphragm material: PTFE

Coil power: AC 18VA (holding)

AC 36VA (inrush)

Protection class: IP 65 (with connector)

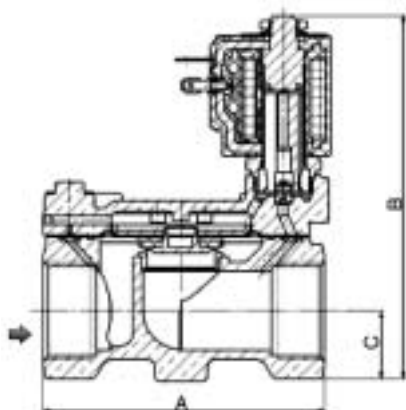
### OPTIONS

Speed control screw (waterhammer free design) Ex. code D622DTYV



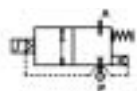
® For a correct functioning, the minimum working temperature of the solenoid valve cannot be below  $60^{\circ}\text{C}$

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D606DTY	3/4"	24	120	1	10	-	7201	24V 50/60Hz
	D622DTY	1"	24	120	1	10	-	7401	110V 50Hz - 120V 60Hz
								7601	200V 50Hz - 220V 60Hz
								7701	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	weight
	[ISO 228]	[mm]	[mm]	[mm]	[Kg]
	3/4"	96	124	23	1.3
	1"	96	124	23	1.3

## 2/2 WAY PILOT OPERATED PISTON VALVE, G 1/4" ÷ G 1/2"



normally closed

TYPE: D634/635/636

### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature: +80°C<sup>®</sup> ÷ +180°C

Ambient temperature: -10°C ÷ +70°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: PTFE

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)

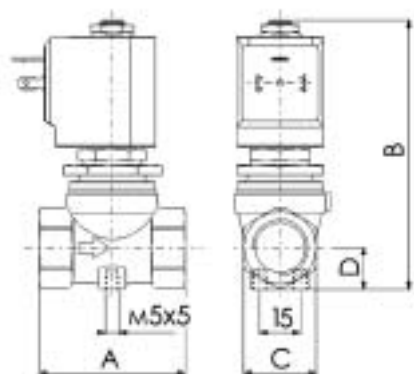
### OPTIONS

Electroless nickel plating treatment (Ex. code D636DTTK)



<sup>®</sup> For a correct functioning, the minimum working temperature of the solenoid valve cannot be below 80°C

SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D634DTT	1/4"	10.0	21	0.3	10	10	7251	24V DC
	D635DTT	3/8"	10.0	24	0.3	10	10	7201	24V 50/60Hz
	D636DTT	1/2"	10.0	25	0.3	10	10	7401	110V 50Hz - 120V 60Hz
								7601	200V 50Hz - 220V 60Hz
								7701	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/4"	54	100	CH 17	15.5	0.465
	3/8"	54	100	CH 17	15.5	0.465
	1/2"	54	100	CH 17	15.5	0.465

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/4"

WITH FLOW REGULATION



normally closed

TYPE: D267

### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature: -10°C ÷ +180°C

Ambient temperature: -10°C ÷ +70°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: Sigodur (filled PTFE)

Coil power: AC 18VA (holding)

AC 36VA (inrush)

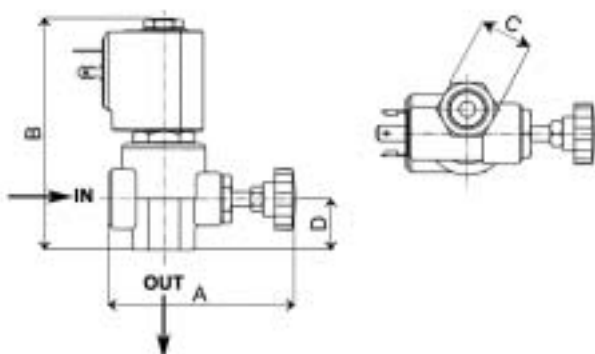
DC 14W

Protection class: IP 65 (with connector)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	class "H" only	
					[bar]	AC [bar] DC [bar]	Code	[Volts/Hz]
	D267DLE	1/4"	2.0	2.2	0	10 10	7251	24V DC
	D267DLG	1/4"	2.5	3.4	0	10 10	7201	24V 50/60Hz
	D267DLH	1/4"	3.0	4.5	0	10 8	7401	110V 50Hz - 120V 60Hz
	D267DLL*	1/4"	4.0	6.0	0	8 5	7601	200V 50Hz - 220V 60Hz
							7701	230V 50Hz - 240V 60Hz

\* NO version not available



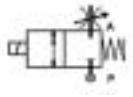
DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/4"	55 ÷ 60	88	CH 19	16.5	0.26

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/4" - G 3/8"

WITH FLOW REGULATION

normally closed

TYPE: D260/261



### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature: -10°C ÷ +150°C

Ambient temperature: -10°C ÷ +70°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: Sigodur (filled PTFE)

Coil power: AC 18VA (holding)

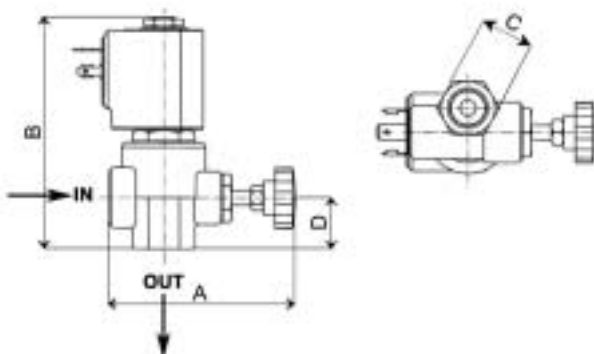
AC 36VA (inrush)

Protection class: IP 65 (with connector)

Not RoHS compliant

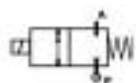


SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D260DLP	1/4"	6.0	8.5	0	5.0	-	7201	24V 50/60Hz
	D261DLP	3/8"	6.0	8.5	0	5.0	-	7401	110V 50Hz - 120V 60Hz
								7601	200V 50Hz - 220V 60Hz
								7701	230V 50Hz - 240V 60Hz



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/4"	72 ÷ 80	96	CH 22	20	0.395
	3/8"	72 ÷ 80	96	CH 22	20	0.395

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



normally closed

TYPE: D262/263

### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature:  $-10^{\circ}\text{C} \div +180^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +70^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: Sigodur (filled PTFE)

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14W

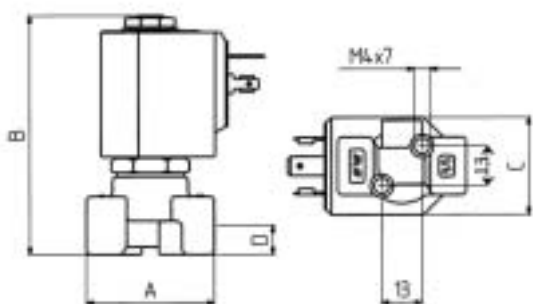
Protection class: IP 65 (with connector)

### OPTIONS

Manual override (Ex. code D262DLAM)



SELECTION TABLE	VALVE		G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]				min	max	Code	class "H" only
	D262DLA	1/8"	1.0	0.5	0	10	10	7251	24V DC
	D262DLC	1/8"	1.5	1.3	0	10	10	7201	24V 50/60Hz
	D262DLG	1/8"	2.5	3.4	0	10	10	7401	110V 50Hz - 120V 60Hz
	D262DLH	1/8"	3.0	4.5	0	10	8	7601	200V 50Hz - 220V 60Hz
	D263DLA	1/4"	1.0	0.5	0	10	10	7701	230V 50Hz - 240V 60Hz
	D263DLC	1/4"	1.5	1.3	0	10	10		
	D263DLG	1/4"	2.5	3.4	0	10	10		
	D263DLH	1/4"	3.0	4.5	0	10	8		

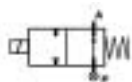


DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	40	77.5	32	11	0.26
	1/4"	40	77.5	32	11	0.26

Flow direction overseat 1→2



## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G1/4"



normally open

TYPE: RD236

### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature:  $-10^{\circ}\text{C} \div +180^{\circ}\text{C}$

Ambient temperature:  $-10^{\circ}\text{C} \div +70^{\circ}\text{C}$

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Main seal material: Sigodur (filled PTFE)

Coil power: AC 18VA (holding)

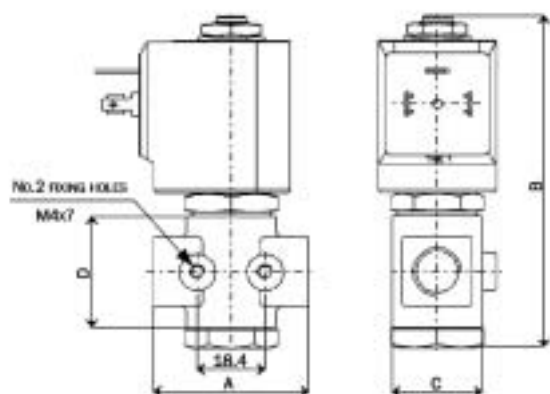
AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	class "H" only
					[bar]	AC [bar]	DC [bar]		[Volts/Hz]
	RD236DLA	1/4"	1.0	0.5	0	10	10	7251	24V DC
	RD236DLC	1/4"	1.5	1.3	0	10	10	7201	24V 50/60Hz
	RD236DLE	1/4"	2.0	2.0	0	10	10	7401	110V 50Hz - 120V 60Hz
	RD236DLH	1/4"	3.0	3.5	0	10	10	7601	200V 50Hz - 220V 60Hz
								7701	230V 50Hz - 240V 60Hz

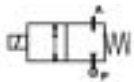


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
1/4"	42	89	24.5	30.3	0.25

Flow direction overseat 1→2

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, G 1/8" - G 1/4"



HIGH PRESSURE

normally closed

TYPE: D262/263

### TECHNICAL SPECIFICATIONS

Media: water, steam

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 UNIEN 10088-3)

Operator material: stainless steel

Seal material: Ruby

Coil power: AC 18VA (holding)

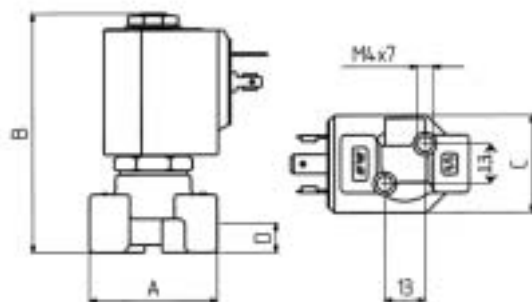
AC 36VA (inrush)

DC 14W

Protection class: IP 65 (with connector)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD			COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max		Code	[Volts/Hz]
	D262DRA1	1/8"	1.0	0.5	0	150	70	7250	24V DC
	D262DRB1	1/8"	1.2	0.7	0	150	70	7200	24V 50/60Hz
	D262DRC1	1/8"	1.5	1.3	0	150	70	7400	110V 50Hz - 120V 60Hz
	D263DRA1	1/4"	1.0	0.5	0	150	70	7600	200V 50Hz - 220V 60Hz
	D263DRB1	1/4"	1.2	0.7	0	150	70	7700	230V 50Hz - 240V 60Hz
	D263DRC1	1/4"	1.5	1.3	0	150	70		

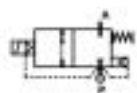


DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/8"	40	77.5	32	11	0.26
	1/4"	40	77.5	32	11	0.26

Flow direction overseat 1→2

## 2/2 WAY PILOT OPERATED PISTON VALVE, G 1/4" ÷ G 1/2"

HIGH PRESSURE



normally closed

TYPE: D634/635/636DTT1

### TECHNICAL SPECIFICATIONS

Media: water, air, oil

Media temperature: +10°C ÷ +130°C

Ambient temperature: -10°C ÷ +70°C

Body material: brass (CW617N EN 12165)

Orifice material: stainless steel (AISI 303 EN 10088-3)

Operator material: stainless steel

Seal material: PTFE

Coil consumption: AC 25VA (holding)

AC 50VA (inrush)

DC 22W

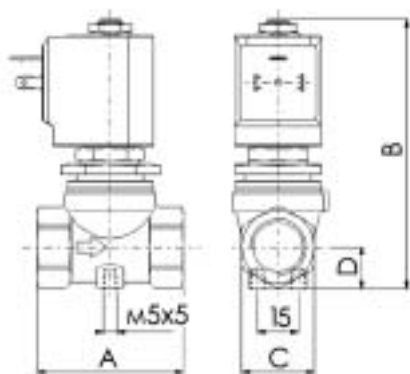
Protection class: IP 65 (with connector)

### OPTIONS

Electroless nickel plating treatment (Ex. code D636DTTK1)



SELECTION TABLE	VALVE	G connection	Nominal Diameter	Flow rate kvs	OPD		COILS	
	Code	[ISO 228]	[mm]	[l/min]	min	max	class "H" only	
	D634DTT1	1/4"	10	21	0.3	100	60	72Z1
	D635DTT1	3/8"	10	24	0.3	100	60	72K1
	D636DTT 1	1/2"	10	25	0.3	100	60	74K1
								77K1



DIMENSIONS & WEIGHTS	G connection	A	B	C	D	weight
	[ISO 228]	[mm]	[mm]	[mm]	[mm]	[Kg]
	1/4"	54	100	CH 17	15.5	0,465
	3/8"	54	100	CH 17	15.5	0,465
	1/2"	54	100	CH 17	15.5	0,465



## PILOT OPERATOR FOR USE IN DANGEROUS ATMOSPHERES (ATEX)

SERIES: N



THE FOLLOWING M&M VALVES CAN BE FITTED WITH EXPLOSION-PROOF OPERATOR, CLASS EEX M II 2GD T4, THE OPERATING PRESSURE REMAINING THE SAME THAN THE STANDARD VALVE<sup>(1)</sup>:

- D262 - D263
- D204 - D205 - D222
- D206DVY
- D223 - D224 - D225
- D298 - D299
- D326
- D362 - D363 (w/o manual override)



### COILS TECHNICAL SPECIFICATIONS

Coils are supplied with 3 mt power cable, wired on a non-removable plug

Cable type : H05V2V2-F 3G1

Degree of protection: IP 65

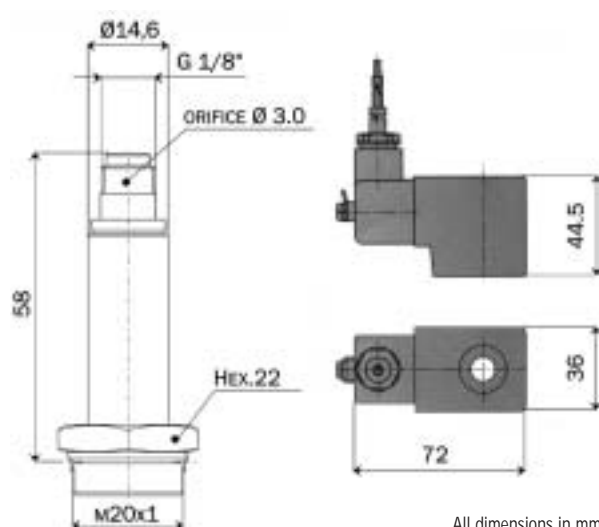
Insulation class: "F" EN 60730

Voltage tolerance: -10% ÷ +10%

Operation: continuous

Protection class: EEx m II 2GD T4

### DIMENSIONS



All dimensions in mm

### OPERATOR TECHNICAL SPECIFICATIONS

Operator material: stainless steel

Seal material: FKM

2/2 way NC operator (code N014DVH)

3/2 way NC operator (code N014CVH)

### SELECTION TABLE

CODE	Voltage	Power holding	insulation class	room temperature		medie temperature		ED	fuse <sup>(1)</sup>
				min	max	min	max		
N253	24V DC	10,1 W							800
N203	24V 50/60Hz	7,2 VA							800
N403	110V - 50Hz	9,1 VA	F	-20°C	+50°C	-20°C	+80°C	100%	200
NK03	120V - 60Hz	8,6 VA							200
N703	230V - 50Hz	8,5 VA							100

#### NOTES

(1) Manual override not available for Eex solenoid valves.

#### SAFETY WARNINGS

(1) A mains fuse or an equivalent means of protection (breaking value shown on table for each coil) shall be installed on the mains supply line. Absence of mains protection is a non conformity to safety standards (EC Directives 94/9/CE and 1999/92/CE) and is a possible cause of explosion.

(2) Valves for potentially explosive atmospheres are available from factory only. **USE OF COIL OR OPERATOR ONLY DOESN'T MAKE THE VALVE EXPLOSION-PROOF.**

SPECIAL VERSIONS AVAILABLE UPON REQUEST. PLEASE CONTACT M&M FOR DETAILS.

## COILS FOR M&M INTERNATIONAL SOLENOID VALVES

Coils manufactured by M&M International are designed for continuous duty in conformity to the EN60730 safety standards. They are encapsulated in a self-extinguishing synthetic material and offer high mechanical protection and excellent thermal dissipation. They are fully interchangeable on all M&M International solenoid valves, thereby reducing warehouse inventories.

### TECHNICAL DATA

Series 2000: connection to DIN 46244

Electrical connection: fast on connection 6.3x0.8

Series 7000: connection to DIN EN 175301-803 form A (ex DIN 43650-A)

Protection class: IP65 (with connector) - EN 60529

Insulation class: "F" and "H" EN60730

Voltage tolerance: +10% ÷ -15% AC / + 10% ÷ -5% DC

Operation: continuous

Coil power:	SERIES 2000	SERIES 7000
AC	10VA	18VA (holding)
AC	16VA	36VA (inrush)
DC	7W	14W

### SERIES: 2000/7000

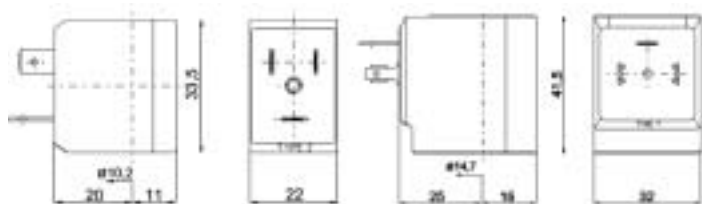


### OPTIONS

Series 7000 coils with insulation class "H" (e. g. coil 7251)

UL Approved coils (series 2000 and 7000) (e. g. coil 240R)

### DIMENSIONS & WEIGHTS



Series 2000: Kg 0.060

Series 7000: Kg 0.146

VOLTAGE & FREQUENCY	Cod. Series 2000	Cod. Series 7000	[volts/Hz]
	2150	7150	12V DC
	2250	7250	24V DC
	2200	7200	24V 50-60Hz
	2400	7400	110V 50Hz - 120V 60Hz
	2600	7600	200V 50Hz - 220V 60Hz
	2700	7700	230V 50Hz - 240V 60Hz

## DIN CONNECTORS FOR SOLENOID VALVES

Coil connectors provide the safest flexible system for connecting M&M International solenoid valves and give a protection class of IP65. They are designed and made of synthetic material offering a high level of electrical insulation.

### TECHNICAL DATA

Rated voltage (Max.): 250V AC-300V DC

Nominal current: 10 A (Rated)/16A (Max.)

Wire cross-section: 1.5 mm<sup>2</sup> (Max.)

Cable diameter: 6-8 mm (PG9)

Protection class: IP65 - EN 60529

Insulation class: group C - VDE 0110

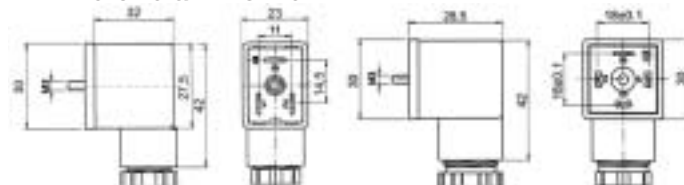
Colour: black

Supplied with screw and NBR gasket

### SERIES: 600 001 000/011 000



### DIMENSIONS & WEIGHTS



For coil series 2000 - Series 600 001 000: kg 0.019

For coil series 7000 - Series 600 011 000: kg 0.020


All dimensions are in millimetres



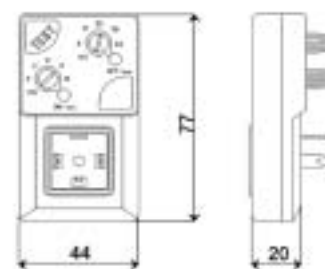
## ANALOG AND DIGITAL ELECTRONIC TIMERS

Ideal for: Automatic Drain Valves - Sampling Valves - Lubrication Systems - Air Dryers


### ANALOG TIMER TECHNICAL SPECIFICATIONS

Supply voltage:	120 ÷ 240V AC/DC - 50Hz/60Hz for  and CE <sup>®</sup> approved Timer (Code AT2000C02I*)
Absorption:	4 mA Max
Operating temperature:	- 10° C + 50° C
Class protection:	IP 65 - EN 60529 (with connector and gasket)
Switch holding voltage:	400V Max
Switch capacity:	1A
Inrush current:	10A for 10 ms
Duty cycle:	100% ED
Switch life:	3·10 <sup>8</sup>
Repeat accuracy:	± 1%
Timing temperature coefficient:	± 0.005% - C°
Time ON:	■ from 0.5 to 10 s.
Time OFF:	■ from 30 s. to 45 min.
Set/Reset/Test:	Membrane key
Circuit:	UL 94 V0
Indicators:	GREEN LED for "power ON" RED LED for "valve open"
Manual override:	Test
Colour:	Black

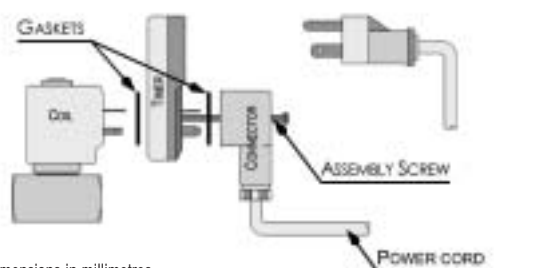
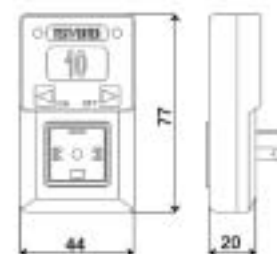
### SERIES: AT2000



### DIGITAL TIMER TECHNICAL SPECIFICATIONS

Supply voltage:	120 ÷ 240V AC/DC - 50Hz/60Hz for  and CE <sup>®</sup> approved Timer (Code DT3000C12I*)
Absorption:	4 mA Max
Operating temperature:	- 10° C + 50° C
Class protection:	IP65 - EN 60529 (with connector and gasket)
Switch holding voltage:	400V Max
Switch capacity:	1A
Inrush current:	10A for 10 ms
Duty cycle:	100% ED
Switch life:	3·10 <sup>8</sup>
Repeat accuracy:	± 0.01%
Timing temperature coefficient:	± 0.0001% - C°
Time ON:	■ from 0 to 9.5 s., step 0.5 s. from 10 to 99 s., step 1.0 s.
Time OFF:	■ from 0 to 9.5 min., step 0.5 min. from 10 to 99 min., step 1 min.
Indicators:	GREEN LED for "power ON" RED LED for "valve open"
Manual override:	Test
Colour:	Black

### SERIES: DT3000



All dimensions in millimetres

\*  approval number E200580

① For supply voltage 24V AC/DC please contact Sales Department.

Note: Timers are supplied in single boxes with two squared gaskets and M3X50 fixing screw (see assembling scheme)

## VALVE SELECTION

A solenoid valve should be chosen whenever the following conditions are met:

- ✓ Media with few dirt particles
- ✓ Moderate flow volumes
- ✓ Average differential pressures
- ✓ High speed in operation

### VALVE TYPES

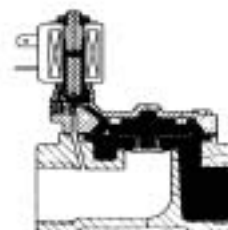
✓ **Direct acting solenoid valves 2/2 and 3/2 way NC or NO**

The supply coil electrically generates a magnetic force that attracts the armature, which contains the seat that acts upon a passage orifice. The armature, rising, lets the fluid pass. The range of operating pressures depends directly on the attraction force of the coil. Average response time 5 ÷ 25 ms.



✓ **Pilot operated solenoid valves 2/2 way NC or NO**

This solenoid valve uses the force of the fluid to operate the valve via a suitable integral pilot valve. The inlet pressure must always be at least the same as the minimum  $\Delta P$  figure shown on the data sheets. Using the same coils as direct acting valves much higher fluid volumes and pressures can be controlled with this solenoid valve. Average response time 50 ÷ 500 ms.



✓ **Pilot operated solenoid valves with assisted lift 2/2 way NC**

These solenoid valves are a combination of the pilot operated valves and the direct acting valves. The armature is mechanically connected to the diaphragm on which there is a pilot orifice. With minimal pressures the solenoid valve acts like a direct acting valve. Total opening as well as full flow do not occur at low pressures. With higher pressures it works as a pilot operated valve with full opening. Average response time 50 ÷ 500 ms.



### FUNCTION TYPES

2/2 way function indicates valves with inlet and outlet connections, whilst valves with 3/2 way functions have 3 connections and 2 flow passages. One orifice always remains open and one closed. Connections and flow direction are shown in the symbols on each technical data sheet (DIN-ISO 1219).

At rest valves can be either normally closed (NC) or normally open (NO):

- Normally closed (NC): the valve opens when the coil is energised.
- Normally open (NO): the valve closes when the coil is energised.

## OPTIONAL FEATURES

### ✓ Manual Override (M)

Normally closed direct acting and pilot operated solenoid valves can be supplied with a manual override which allows the valve to be opened independently of electrical current.

### ✓ Waterhammer Control (V)

Pilot operated solenoid valves (only versions specified in each datasheet) can be supplied with a system that regulates the closing speed of the diaphragm in order to control waterhammer.

## TECHNICAL INFORMATION

The following points should be considered to ensure a correct choice of valve:

### ✓ Connections and Nominal Diameters

Threaded connections are either "G"- inches (ISO 228) or metric. Nominal diameters (DN) are expressed in millimetres and correspond to the diameter of the valve's main orifice.

### ✓ Operating Pressure Differential (OPD)

Pressure values shown in this catalogue are maximum pressures expressed in bar with zero pressure at outlet. For 3/2 way solenoid valves the pressure range can vary when used in other functions or systems. The maximum working pressure (PN) that the valve can bear is generally equal to 1.5 times the maximum value of the operating pressure differential (OPD).

### ✓ Flow

The flow is the quantity of fluid that passes through the valve's main orifice which has the nominal diameter (DN) shown in the tables. The flow is given with a constant Kv value (according to VDI/VDE 2173) that shows how many litres of water, at a temperature of 20°C, flow through the valve in one minute with a pressure difference of one bar across the valve. To determine the flow at higher pressures, multiply the Kv value by the square root of the differential pressure. Flow values shown in the selection tables are subject to a tolerance of  $\pm 15\%$ .

### ✓ Seal materials

Consideration of the media should be made when selecting seal and body types.

**NBR** should be used for air, water, neutral gases, diesel and in general it is resistant to oils and grease from -10°C to +90°C.

**EPDM** for hot water and steam. It is resistant to bases and acids in weak concentrations from -40°C to +140°C. EPDM seals should not be used for media containing oil.

**FKM** combines most of the characteristics of NBR and EPDM and is particularly suitable for hot water and hydrocarbons from -10°C to +140°C.

**PTFE** is practically resistant to all media. It is rigid and is used from -20°C to +180°C.

**SIGODUR (filled PTFE) and RUBY** are stiff materials particularly suitable for heavy duty applications.

All the data shown in the selection tables refer to media with a viscosity not higher than 21 cST (3°E) (1 centistoke=1 mm<sup>2</sup>/s).

### ✓ Coil power supply

It is important that the exact voltage and frequency of the coil is used for the valve to operate correctly. Provided the coil is fitted correctly on the operator and that the armature is not obstructed, the valve can be operated for an indefinite time within the temperature limitations indicated. All solenoid valves have a copper shading ring to reduce vibrations caused by alternating currents.

### ✓ Media and Ambient Temperatures

Temperature limits for the media are shown and should be used as a guide to valve selection. Normally the maximum ambient temperature can reach +50°C for solenoid valves with coils in class "F", +70°C for class "H". For applications outside these limits please contact our technical office.

### ✓ General purpose solenoid valves

Solenoid valves shown in this catalogue, either normally open or normally closed, are intended to control the flow of fluids and cannot be used as safety valves.

## VALVE INSTALLATION

To ensure trouble-free operation please observe the following:

✓ **Safety**

Always connect the coil's earth terminal to ground to ensure the safety of the user and installation.

✓ **Installation**

Keep the valve operator in a vertical position, facing upwards. This prevents limescale or dirt particles in the operator tube which could restrict the armature or create excessive noise whilst operating.

✓ **Connections**

To ensure that the solenoid valve works properly, do not connect to pipework with an internal diameter less than the nominal diameter (DN) of the valve. Clean all pipework before connection to the solenoid valve.

**The recommended tightening torque of the coil nut to avoid damage of the valve components is 0,5 Nm.**

✓ **Flow Direction**

Respect the direction of flow across the valve, shown with an arrow or by numbers on the valve body, depending on the model type.

✓ **Filtration**

If the fluid contains dirt particles it is necessary to install a filter upstream of the solenoid valve. Dirt is the most frequent cause of malfunction.

✓ **Environment**

Coils fitted with suitable connectors have a protection class of IP65. However, it is advisable not to use the solenoid valve outside or in very damp conditions without adequate protection. Provide sufficient ventilation for the solenoid valve. **During continuous service the coil of the solenoid valve becomes hot and should not be touched.**

## TECHNICAL INFORMATION PAGE

For additional technical information please copy this page and fax it to us duly completed at No. +39 035 531763  
We will be pleased to answer all of your queries.

✓ **Company**

.....

✓ **Name and position**

.....

✓ **Fax number**

.....

✓ **Actuator**

☐

solenoid

☐

pneumatic

✓ **Operation**

☐

direct act.

☐

pilot operated

☐

assisted lift

✓ **Type**

☐

2/2

☐

3/2

✓ **Connections**

.....

✓ **Media temperature**

.....

✓ **Media pressure**

nominal..... min. .... max. ....

✓ **Ambient temperature**

.....

✓ **Application**

.....

✓ **Sketches or Drawings**

✓ **Address**

.....

✓ **Telephone number**

.....

✓ **E-mail address**

.....

✓ **Function**

☐

NO

☐

NC

✓ **Controlled media**

.....

✓ **Pilot media** (only for pneumatic valves) / **Pilot media pressure**

.....

✓ **Flow**

.....

✓ **Electrical supply**

☐

AC

☐

DC

Volts ..... Frequency .....

Max. Power Consumption .....

✓ **Notes**

.....

.....

✓ **Valve presently in use** (brand / type)

.....

✓ **Annual quantity**

.....

✓ **Date**

.....

✓ **Signature**

.....



## CE MARKING

The CE mark indicates that the product satisfies all the regulations governing safety laid down by the European Community. Products displaying this mark can be freely distributed within the markets of the European Community.

### ✓ EC Directives

EC directives for product safety were issued to unify regulations and working practices in force in the countries of the community prior to the constitution of the European Union.

The following three directives concern electrical appliances and machines in general:

Machinery Directive

EMC Directive

Low Voltage Directive

The directive EC 97/23 concerns safety of pressure bearing equipment.

The directive 2002/95/EC (RoHS) limits the use of dangerous substances in electrical and electronic equipment.

### ✓ M&M International products conforming to the EC directives

Products subject to the Low Voltage Directive are given a certification by the European Community.

M&M International issues declarations of conformity such as in the attached form "Declaration of conformity to EC" (see the example below).

We believe that our products are components and as such do not form a part of the range of products subject to the EMC directive. However, conformity of M&M International products to the EMC directive could change depending on the function of the product's use, of the configuration (for example the use of connectors with passive electronic components, LED etc.), or the conditions of the electrical connection. For this reason it is recommended that you check that your final product conforms to the EMC directive.

## EXAMPLE OF DECLARATION OF CONFORMITY TO CE

**The company M&M International S.r.l. - Via Portico, 17 - 24050 Orio al Serio (BG) - Italy**

Declares that the products:

### **SOLENOID VALVES FOR GENERAL PURPOSES**

Are fitted by coils complying with the technical manual issued by M&M, referring to the following Harmonized Standards:

**EN 60730-1**

**EN 60529**

Therefore the products, when used in compliance with the directions quoted in the data sheets and following the instruction of installation and use, comply with the essential requirements of the directives:

### **73/23/EC and amendment 93/68/EC**

 mark on products since 1997

M&M valves are also developed and constructed in compliance with the requirements of the directive concerning pressure bearing equipment

### **97/23 EC, art. 3.3**

Orio al Serio, January 2, 2002

**M&M international S.r.l.**

Managing Director

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CODE:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ELECTRICAL SUPPLY:																						
- = CA																						
C = DC																						
Z = 5V Proportional DC																						
FUNCTION:																						
- = Normally Closed																						
S = 2nd Service																						
R = Normally Open																						
W = Winding																						
SERIAL LETTER:																						
B = Armature Ø 10 mm																						
D = Armature Ø 14.5 mm																						
N = Armature Ø 14.5 mm for 8V ATEX 230																						
TYPE OF VALVE:																						
1 = 2/2 Ways Assisted L/H																						
2 = 2/2 Ways																						
3 = 3/2 Ways																						
6 = For clean																						
8 = Various																						
9 = Special Balanced valves																						
FIXED CORE TYPE:																						
A = 3/2 WAYS GAS T18° SPHERICAL																						
C = 3/2 WAYS GAS T18° FOR BICONE																						
D = 2/2 WAYS GAS T18°																						
E = 3/2 WAYS GASKET HOLDER																						
Ø ORIFICE (bar)																						
Tenths of mm																						
MARK																						
DIA/ITER																						
A = 10																						
B = 12																						
C = 14 - 15 - 16																						
D = 17 - 18																						
E = 20																						
F = 22 - 23																						
G = 25																						
H = 30 - 32																						
I = 35																						
L = 40																						
M = 45																						
N = 50																						
O = 55																						
P = 60																						
Q = 75																						
R = 80																						
S = 90																						
T = 100																						
U = 105 - 110																						
V = 115 - 120																						
Z = 130																						
M = 140 - 150 - 155																						
X = 180 - 200																						
Y = 240 - 250																						
N = 400																						
J = 500																						
Ø Drilled ORIFICE																						
(number)																						
Tenths of mm																						
MARK																						
DIA/ITER																						
1 = 10																						
2 = 12																						
3 = 14 - 15 - 16																						
4 = 17 - 18																						
5 = 20																						
6 = 22 - 23																						
7 = 25																						
8 = 30 - 32																						
9 = 35																						
SPECIAL EXECUTIONS:																						
A = Slow closing reg.																						
K = Nickel plated treatment																						
M = Natural controls																						
N = NPT thread																						
V = Speed control valve																						
W = Nickel plated treatment+NPT thread+natural controls																						
Y = Nickel plated treatment + Teflon (Tertiary Eco Alloy)																						
COIL CODE																						
CONNECTOR ASSEMBLY																						
CONNECTOR CODE																						
SEAL MATERIAL:																						
MARK MATERIAL																						
B = NBR																						
C = EPDM																						
D = Various seals																						
L = Filled PTFE (Square)																						
M = NEOPRENE																						
MARK MATERIAL																						
N = KOLITE20																						
P = EPDM PX																						
R = RUBBY																						
S = SILICONE																						
T = PTFE																						
V = FKM																						



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