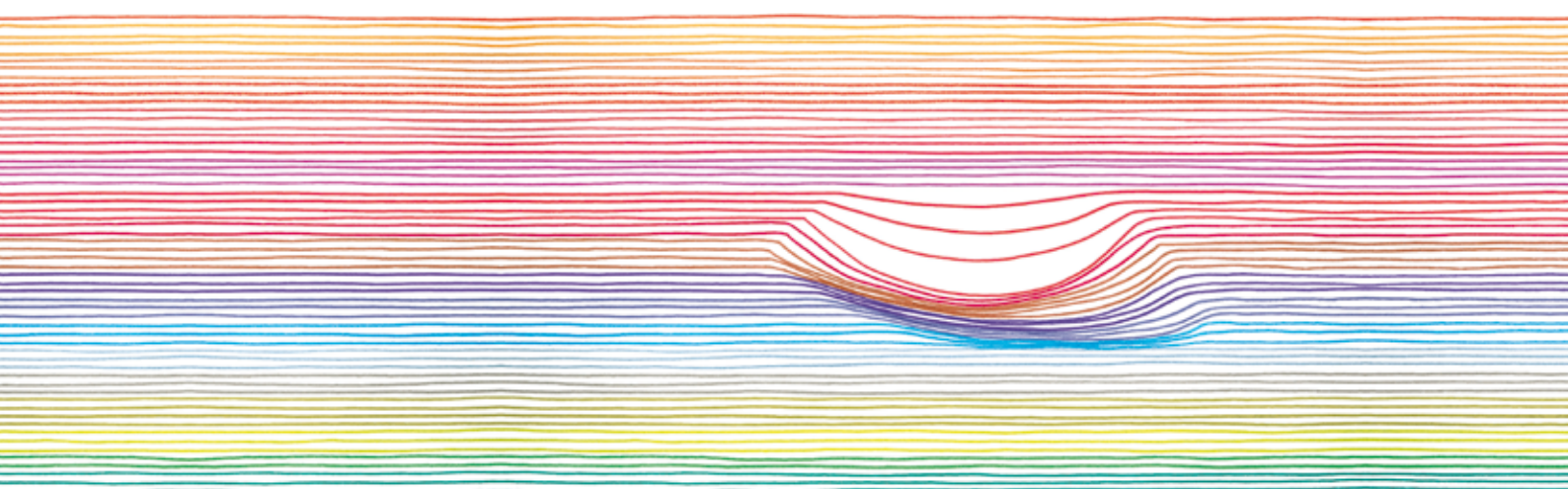


## **solenoid valves**



**The ultimate Technology  
for fluid control**



COMPANY WITH  
MANAGEMENT SYSTEM  
CERTIFIED BY DNV

= ISO 9001 =  
= ISO 14001 =



European  
Community  
Conformity



Underwriters  
Laboratories  
Quality  
Certificate



**The ultimate Technology  
for fluid control**

**m&m** international

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## means:

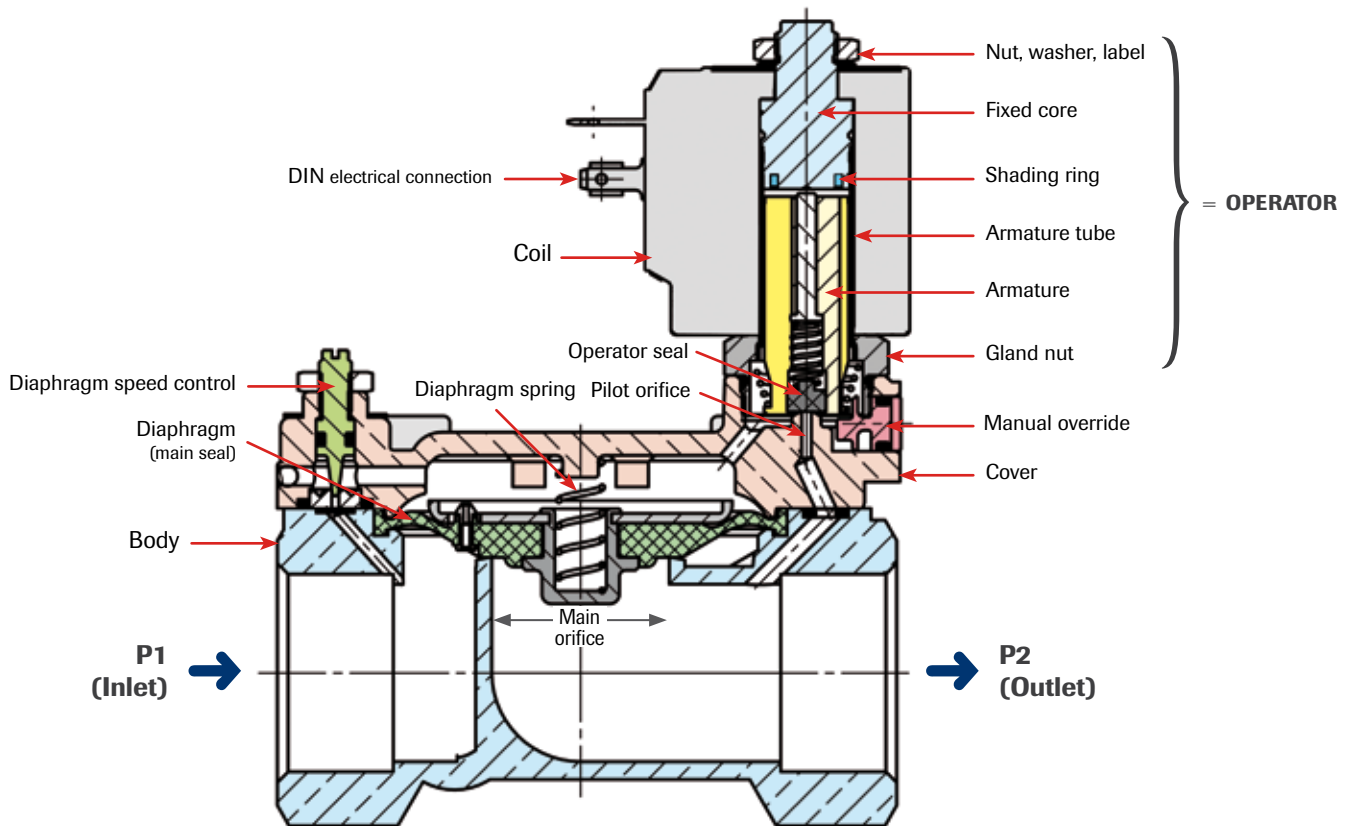
- Working with a staff of qualified professionals
- Enjoying the benefits of the most advanced technological research
- Quality at competitive price
- Warranty of a company conforming to the rigorous ISO 9001 - ISO 14001 requirements
- Reliability of a 30-years experience on international markets
- To partner with a company belonging to a multinational group

### GENERAL INDEX

M&M solenoid valves: features and benefits	page 01
Product index	page 02
Valve selection	page 47
Technical information	page 48
Declaration of conformity to CE	page 51
Technical enquiry form	page 52
Coding chart	page 53

## 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 applications**  
Featuring stainless steel orifice on most models

➔ **High reliability**  
**Long life**

**Stainless steel operators with low residual magnetism**  
according to 1.4105 EN 10088 (AISI 430F)

➔ **Corrosion resistant**  
**High performance**

**High quality seal materials**  
NBR, FKM, EPDM, PTFE, Sigodur (filled PTFE), Ruby, Kalrez®

➔ **High compatibility with a wide range of media**

**Fully interchangeable coils with a wide range of AC and DC voltages**

➔ **High flexibility with reduced stock**

**Coil orientation possible through 360°**

➔ **Simple and quick installation**

**Coils tested 100% in compliance with the current EC directives**  
**Compliance to RoHS directive and to relevant international standards upon request**

➔ **CE** **RU** **US** **Ex**

**Development and realisation of special projects**

➔ **Customer tailored solutions**

## PRODUCT INDEX

This catalogue shows only the standard range for solenoid valve products from the M&M International portfolio.  
For specific requests please complete and send us the TECHNICAL ENQUIRY FORM on page 52.

### SOLENOID VALVES FOR PROCESS & GENERAL PURPOSE



D223 ÷ 225  
from 1 1/4" to 2"  
page 04



B203 ÷ 222  
from 1/4" to 1"  
page 05



D506/522  
3/4" and 1"  
page 06



D264 ÷ 266  
from 1/4" to 1/2"  
page 07

### SOLENOID VALVES FOR PROCESS & AUTOMATION



D187 ÷ 293  
from 1/4" to 1"  
page 08



D884 ÷ 886  
from 1/4" to 1/2"  
page 09



D237 ÷ 239  
from 1/4" to 1/2"  
page 10



D262/263  
1/8" and 1/4"  
page 11



B297  
1/8"  
page 12



D301  
flange 32x32  
page 13



D362/363  
1/8" and 1/4"  
page 14



SD362/363 - DD362/363 -  
GD362/363  
page 15



B397  
1/8"  
page 16

### SOLENOID VALVES FOR COMPRESSED AIR



RD236  
1/4"  
page 17



RD213  
1/8"  
page 18



RB214  
1/8"  
page 19



D201  
flange 32x32  
page 20



D249  
1/4"  
page 21



ADV  
with solenoid valves  
page 22



STRAINERS  
from 1/4" to 1/2"  
page 23



ADV  
with compact PAV  
page 23

## PRODUCT INDEX

### SOLENOID VALVES FOR HIGH PRESSURE



D262/263  
1/8" and 1/4"  
page 24



D298/299  
1/8" and 1/4"  
page 25



D634 ÷ D636  
from 1/4" to 1/2"  
page 26



D232 ÷ D234  
from 3/8" to 3/4"  
page 27



RD236  
1/4"  
page 28

### SOLENOID VALVES FOR STEAM



D606/622  
3/4" and 1"  
page 29



D887 ÷ 892  
from 1/4" to 1"  
page 30



D634 ÷ D636  
from 1/4" to 1/2"  
page 31



D262/263  
1/8" and 1/4"  
page 32



D267  
1/4"  
page 33

### SOLENOID VALVES FOR AGGRESSIVE FLUIDS



B298  
1/8"  
page 34



D298/299  
1/8" and 1/4"  
page 35



B398  
1/8"  
page 36



D398/399  
1/8" and 1/4"  
page 37



D204 ÷ 222  
from 3/8" to 1"  
page 38



WB251  
hose tail  
page 39



246  
hose tail  
page 40



D211  
3/8"  
page 41

### SPECIAL PRODUCTS



BESPOKE PRODUCTS  
page 42



EEX PROOF SOLENOID VALVE  
(ATEX)  
page 43



SERIES 2000/7000  
COILS  
page 44



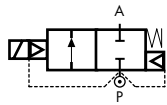
60000100-/60001100-  
CONNECTORS  
page 45



AT2000/DT3000  
ANALOG/DIGITAL TIMERS  
page 46

### MISCELLANEOUS

## 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
Diaphragm material:	NBR
Coil power:	AC 18VA (holding) AC 36VA (inrush) DC 14w
Protection class:	IP 65 (with connector)
Speed control screw	as standard

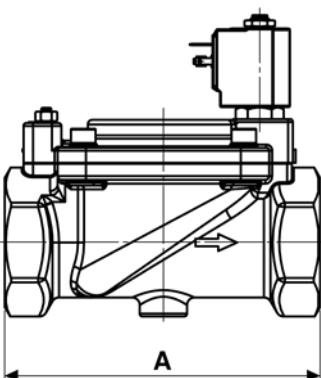
### OPTIONS

Normally open with class "H" coils only (e.g. code RD224DBK 7701)
Manual override (e.g. code D223DBKM)
EPDM seal for air and hot water MAX 120°C (e.g. code D223DEK)
FKM seal for air, water, oil MAX 130°C (e.g. code D223DVK)
EEX proof version see page 43

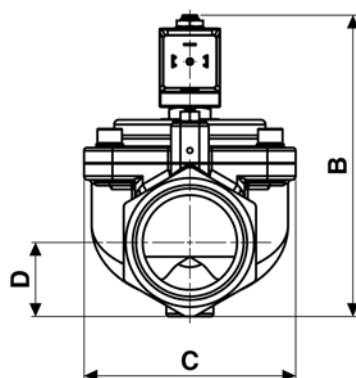


### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D223DBK	1 1/4"	40	370	0.5	16	16	7250	24v DC
D224DBK	1 1/2"	40	400	0.5	16	16	7200	24v 50/60Hz
D225DBJ	2"	50	540	0.5	16	16	7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



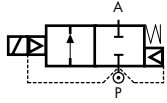
Flow direction over seat 1 → 2



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[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 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
Diaphragm material: NBR
Coil power: AC 10VA (holding)
AC 16VA (inrush)
DC 7W
Protection class: IP 65 (with connector)

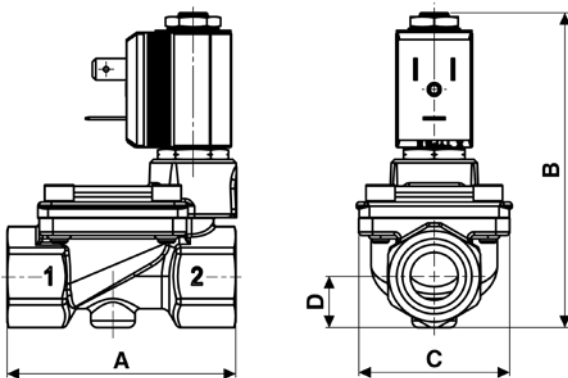
### OPTIONS

Normally open (e.g. code RB206DBY)
Manual override (e.g. code B204DBZM)
Speed control screw (only for B206DBYV and B222DBYV)
EPDM seal for air and hot water MAX 120°C (e.g. code B204DEZ)
FKM seal for air, water, oil MAX 130°C (e.g. code B204DVZ)
Version with operator ø 14,5 and coil type 7000 available upon request (e.g. code D205DBZ)
Version for vacuum OPD min -0,2 bar / max -0,95 bar (e.g. code D203DBZL, c/w operator ø 14,5 only)



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
B203DBZ	1/4"	13	26	0.3	16	16	2250	24v DC
B204DBZ	3/8"	13	55	0.3	16	16	2200	24v 50/60Hz
B205DBZ	1/2"	13	63	0.3	16	16	2400	110v 50Hz - 120v 60Hz
B206DBX compact	3/4"	21	100	0.3	16	16	2600	200v 50Hz - 220v 60Hz
B206DBY	3/4"	25	140	0.3	16	16	2700	230v 50Hz - 240v 60Hz
B222DBY	1"	25	160	0.3	16	16		



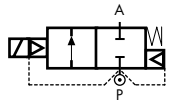
Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	67	90	45.6	15	0.4
3/8"	67	90	45.6	15	0.4
1/2"	67	90	45.6	15	0.4
3/4" compact	82	105	51.6	20.25	0.6
3/4"	96	115	72	23	1.2
1"	96	115	72	23	1.2

## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 3/4" ÷ G 1" - MANUAL RESET

To open the valve it is necessary to push the manual reset button. The closure of the valve is operated by a short electric impulse. The valve uses a standard DC coil. If 230V/AC is supplied, it is necessary to use a connector with integrated half-wave rectifier with reversed polarity (please refer to the wiring diagram).



normally closed

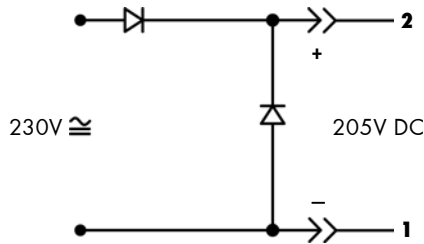
TYPE: D506/522

### TECHNICAL SPECIFICATIONS

- Media: water, oil, air
- Media temperature: -10°C ÷ +80°C
- Ambient temperature: -10°C ÷ +50°C
- Body material: brass (CW617N EN 12165)
- Operator material: stainless steel
- Operator seal material: FKM
- Diaphragm material: FKM
- Coil power: DC 14w
- Protection class: IP 65 (with connector)

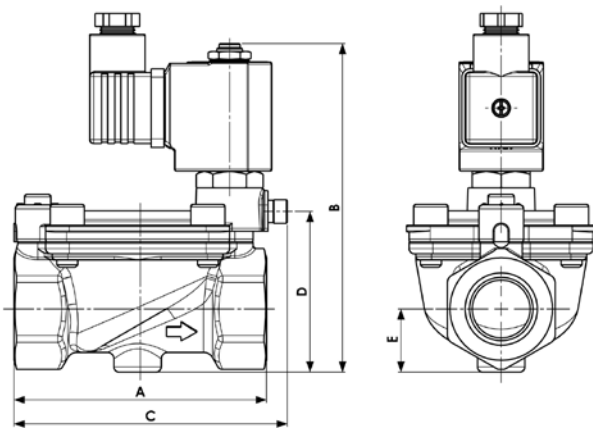
### CONNECTOR - WIRING DIAGRAM -

Connector with integrated half-wave rectifier with reversed polarity code **600 041 00-**



SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D506DVY	3/4"	25	140	0.3	-	16	7250	24v DC
D522DVY	1"	25	160	0.3	-	16	7S51	205v DC



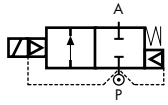
Flow direction overseat 1 → 2

DIMENSIONS & WEIGHTS

G connection	A	B	C	D	E	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
3/4"	96	125	104	61.1	24	1.3
1"	96	125	104	61.1	24	1.5



## 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)

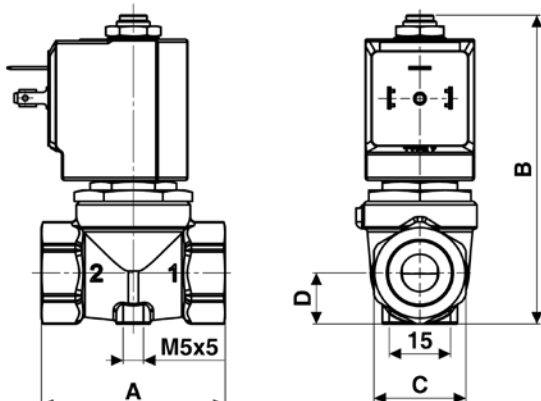
### OPTIONS

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



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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

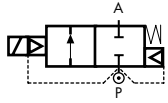


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	54	89	Hex 27	15	0.4
3/8"	54	89	Hex 27	15	0.4
1/2"	54	89	Hex 27	15	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
Main seal and diaphragm material: NBR
Coil power: AC 18VA (holding) AC 36VA (inrush) DC 14w
Protection class: IP 65 (with connector)

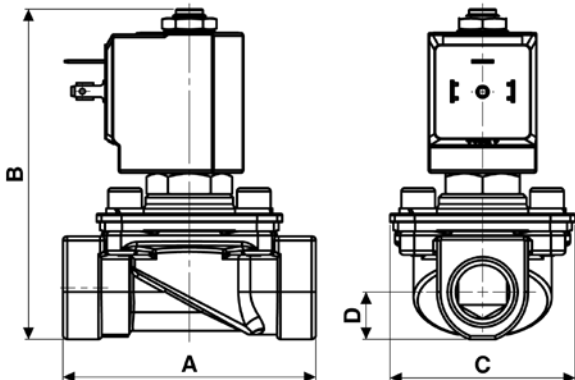
### OPTIONS

- EPDM seal for air and hot water MAX 120°C (e.g. code D188DEW)
- FKM seal for air, water, oil MAX 130°C (e.g. code D187DVW)
- DC MAX 6 barg for D187 ÷ 192 (e.g. code C D187DBW)
- DC MAX 3,5 barg for D293 (e.g. code C D293DBY)
- (\*) Speed control screw as standard for type "D293"
- Version for vacuum OPD min 0 bar / max -0,95 bar (e.g. code D190DBWL, flow direction overseat 2 → 1)



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D187DBW	1/4"	15	50	0	16	•	7200	24v 50/60Hz
D188DBW	3/8"	15	60	0	16	•	7400	110v 50Hz - 120v 60Hz
D189DBW	1/2"	15	65	0	16	•	7600	200v 50Hz - 220v 60Hz
D190DBW	3/4"	15	80	0	16	•	7700	230v 50Hz - 240v 60Hz
D192DBW compact	1"	15	85	0	16	•		
D293DBY (*)	1"	25	140	0	16	•		

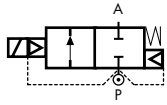


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	75	108	55	14	0.5
3/8"	75	108	55	14	0.5
1/2"	75	108	55	14	0.5
3/4"	85	108	55	21.5	0.8
1" compact	85	108	55	21.5	0.7
1"	100	113	70	21.5	1.2

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



normally closed

TYPE: D884/885/886

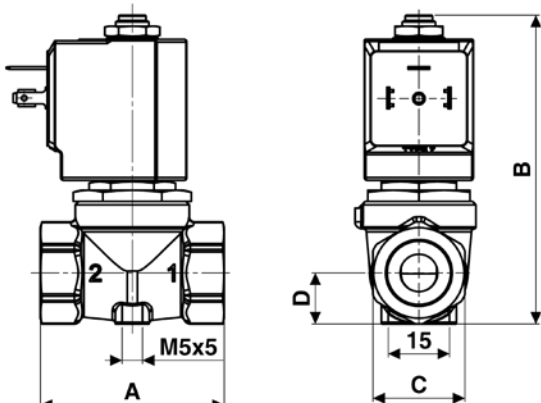
### TECHNICAL SPECIFICATIONS

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
Main 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	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D884DVU	1/4"	10.5	21	0	16	6	7250	24v DC
D885DVU	3/8"	10.5	24	0	16	6	7200	24v 50/60Hz
D886DVU	1/2"	10.5	25	0	16	6	7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz

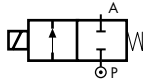


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	54	89	Hex 27	15	0.45
3/8"	54	89	Hex 27	15	0.4
1/2"	54	89	Hex 27	15	0.4

## 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)

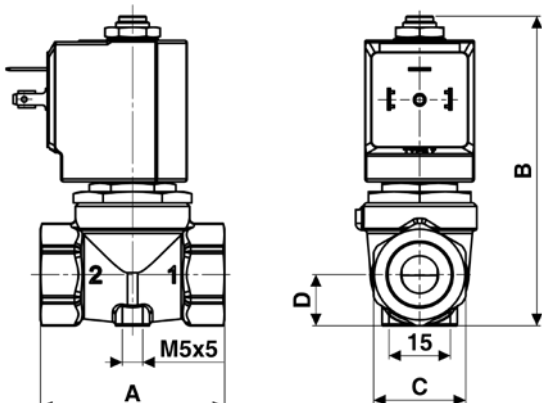
### OPTIONS

- EPDM seal for air and hot water MAX 120°C (e.g. code D239DEU)
- NBR seal for air, water, oil MAX 90°C (e.g. code D237DBU)



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D237DVU	1/4"	10.5	21	0	0.4	0.2	7250	24v DC
D238DVL	3/8"	4.0	6	0	8	5	7200	24v 50/60Hz
D238DVN	3/8"	5.0	7.5	0	5	2	7400	110v 50Hz - 120v 60Hz
D238DVP	3/8"	6.0	8.5	0	3.5	1.1	7600	200v 50Hz - 220v 60Hz
D238DVU	3/8"	10.5	24	0	0.4	0.2	7700	230v 50Hz - 240v 60Hz
D239DVL	1/2"	4.0	6	0	8	5		
D239DVN	1/2"	5.0	7.5	0	5	2		
D239DVP	1/2"	6.0	8.5	0	3.5	1.1		
D239DVU	1/2"	10.5	25	0	0.4	0.2		

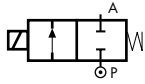


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	54	89	Hex 27	15	0.45
3/8"	54	89	Hex 27	15	0.4
1/2"	54	89	Hex 27	15	0.4

## 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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 18va (holding)
AC 36va (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

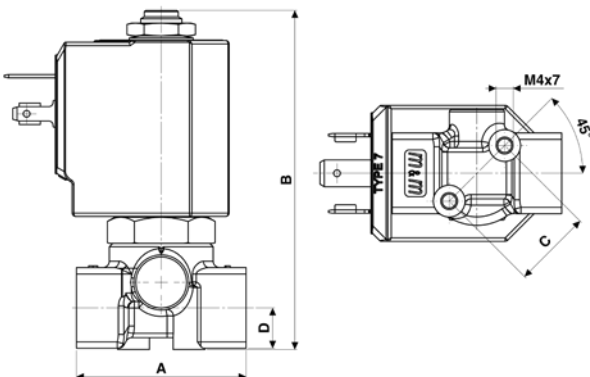
Normally open with class "H" coils only (e.g. code RD263DVG 7701)
Manual override (e.g. code D262DVHM)
EPDM seal for air and hot water MAX 120°C (e.g. code D262DEH)
High pressure version see page 24
Steam version see page 32
EEX proof version see page 43



SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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	10	5		
D263DVN*	1/4"	5.0	7.5	0	5	2.5		
D263DVP*	1/4"	6.0	8.0	0	3	1		

\* Normally open, manual override and high pressure versions not available for orifice size  $\varnothing > 3$  mm

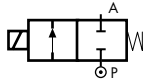


Flow direction overseat 1 → 2

DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	40	77.5	18.5	9.5	0.26

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



normally closed

TYPE: B297

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : 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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 10va (holding) AC 16va (inrush) DC 7w
Protection class: IP 65 (with connector)

### OPTIONS

Normally open (e.g. code RB297DVC)
Manual override (e.g. code B297DVCM)
EPDM seal for air and hot water MAX 120°C (e.g. code B297DEC)
Electroless nickel plating treatment (e.g. code B297DVEK)
NPT connection upon request (e.g. code B297DVEN)

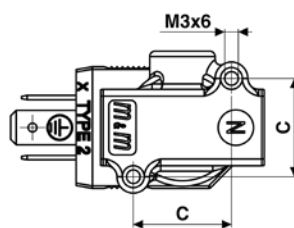
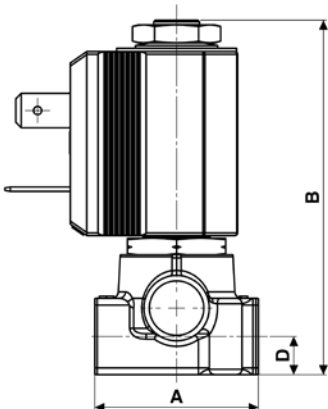
### NOTES

① Valve suitable for contact with food media as per the EEC Directives and Regulations. For more specific information, please contact M&M Sales Department.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
B297DVA	1/8"	1.0	0.5	0	30	28	2250	24v DC
B297DVB	1/8"	1.2	0.7	0	25	22	2200	24v 50/60Hz
B297DVC	1/8"	1.5	1.0	0	22	18	2400	110v 50Hz - 120v 60Hz
B297DVE	1/8"	2.0	1.7	0	18	9	2600	200v 50Hz - 220v 60Hz
B297DVG	1/8"	2.5	2.3	0	13	3	2700	230v 50Hz - 240v 60Hz
B297DVH	1/8"	3.0	3.0	0	8	1		

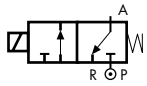


### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8"	30	65	18	7	0.15

Flow direction overseat 1 → 2

## 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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 18va (holding) AC 36va (inrush) DC 14w
Protection class: IP 65 (with connector)

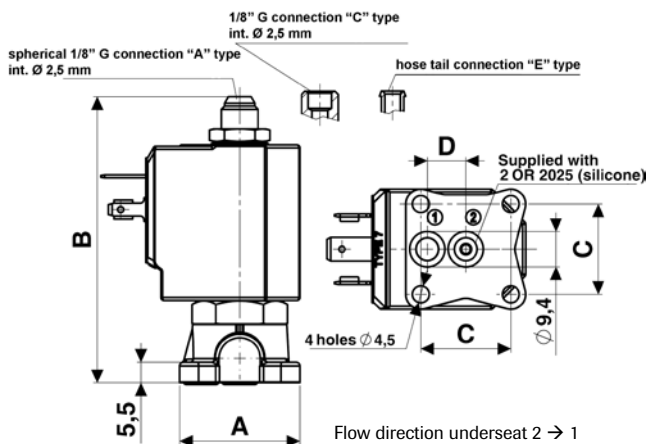
### OPTIONS

- Normally open with class "H" coils only (e.g. code RD301CVG 7201)
- Manual override (e.g. code D301AVCM)
- EPDM seal for air and hot water MAX 120°C (e.g. code D301CEC)
- Ruby seal with class "H" coils for high temperature versions up to 180°C (e.g. code D301ARB 7201)
- Armature tube with spherical 1/8" G connection (e.g. code D301AVC)
- Armature tube with hose tail  $\varnothing$  6 mm (e.g. code D301EVE)



### SELECTION TABLE

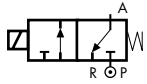
VALVE	square base	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[mm]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D301CVC	32x32	1.5	1.3	0	18	18	7250	24v DC
D301CVE	32x32	2.0	2.2	0	10	10	7200	24v 50/60Hz
D301CVG	32x32	2.5	3.4	0	7	7	7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



### DIMENSIONS & WEIGHTS

Valve	A	B	C	D	weight
code	[mm]	[mm]	[mm]	[mm]	[kg]
D301	$\nabla$ 32	77	24	10.25	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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: FKM
Coil power: AC 18VA (holding)
AC 36VA (inrush)
DC 14w
Protection class: IP 65 (with connector)

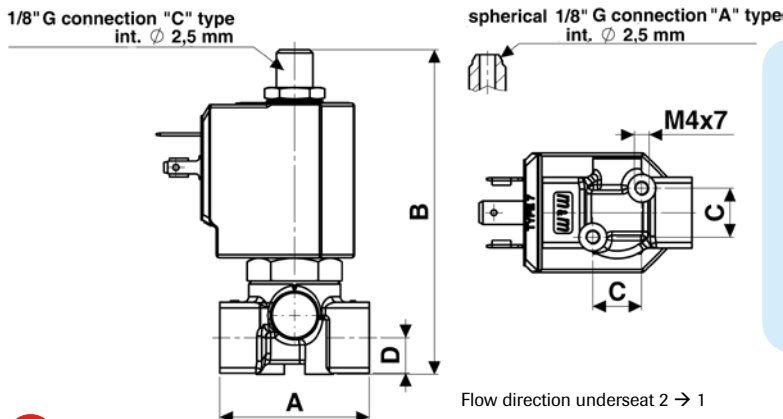
### OPTIONS

- Normally open with class "H" coils only (e.g. code RD362CVC 7701)
- Manual override (e.g. code D362CVGM)
- EPDM seal for air and hot water MAX 120°C (e.g. code D363CEC)
- Ruby seal with class "H" coils for high temperature versions up to 180°C (e.g. code D363ARB 7201)
- Armature tube with spherical 1/8" G connection (e.g. code D362AVC)
- EEX proof version see page 43



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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		



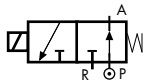
\* Normally open, manual override and Ruby seal versions not available for orifice size  $\varnothing > 3$  mm

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	40	87	13	9.5	0.25



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

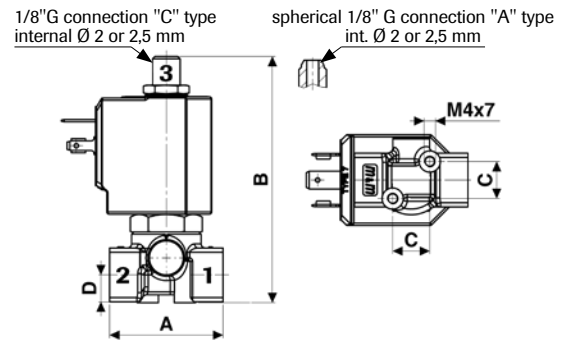


normally open

#### SELECTION TABLE

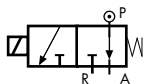
VALVE	G connection	nominal diameter		flow rate Kvs	OPD		
		1 → 2	1 → 3		min	max AC	max DC
code	[ISO 228 G]	[mm]	[mm]	[l/min]	[barg]	[barg]	[barg]
SD362CVC	1/8"	1.5	1.5	1.3	0	15	15
SD362CVE	1/8"	2.0	2.0	2.2	0	15	15
SD362CVG	1/8"	2.5	2.5	3.4	0	13	13
SD363CVC	1/4"	1.5	1.5	1.3	0	15	15
SD363CVE	1/4"	2.0	2.0	2.2	0	15	15
SD363CVG	1/4"	2.5	2.5	3.4	0	13	13

#### TYPE: SD362/363



Flow direction: **OFF** 3 → 1 - **ON** 1 → 2

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

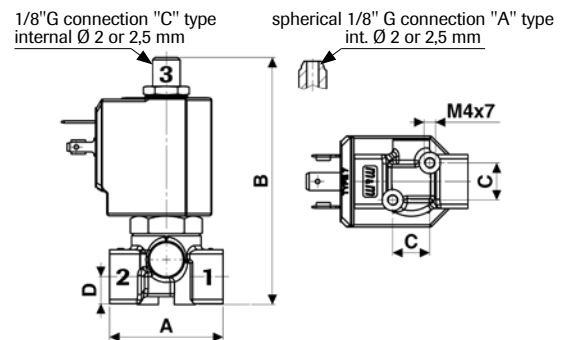


normally open

#### SELECTION TABLE

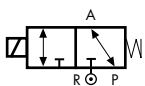
VALVE	G connection	nominal diameter		flow rate Kvs	OPD		
		1 → 2	1 → 3		min	max AC	max DC
code	[ISO 228 G]	[mm]	[mm]	[l/min]	[barg]	[barg]	[barg]
DD362CVC	1/8"	1.5	2.5	1.3	0	20	20
DD362CVE	1/8"	2.0	2.5	2.2	0	20	20
DD363CVC	1/4"	1.5	2.5	1.3	0	20	20
DD363CVE	1/4"	2.0	2.5	2.2	0	20	20

#### TYPE: DD362/363



Flow direction: **OFF** 1 → 3 - **ON** 1 → 2

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

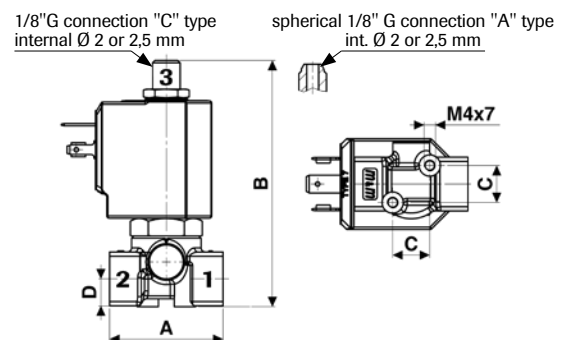


universal service

#### SELECTION TABLE

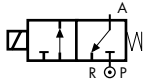
VALVE	G connection	nominal diameter		flow rate Kvs	OPD		
		1 → 2	1 → 3		min	max AC	max DC
code	[ISO 228 G]	[mm]	[mm]	[l/min]	[barg]	[barg]	[barg]
GD362CVE	1/8"	2.0	2.0	2.2	0	8	7
GD363CVE	1/4"	2.0	2.0	2.2	0	8	7

#### TYPE: GD362/363



Pressure can be connected to all ports:  
from 2 like D362, from 1 like DD362, from 3 like SD362

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



normally closed

TYPE: B397

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : 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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 10VA (holding) AC 16VA (inrush) DC 7W
Protection class: IP 65 (with connector)

### OPTIONS

Normally open (e.g. code RB397CVE)
Manual override (e.g. code B397CVBM)
EPDM seal for air and hot water MAX 120°C (e.g. code B397CEC)
Armature tube with hose tail Ø 6 mm (e.g. code B397EVE)
Electroless nickel plating treatment (e.g. code B397CVCK)

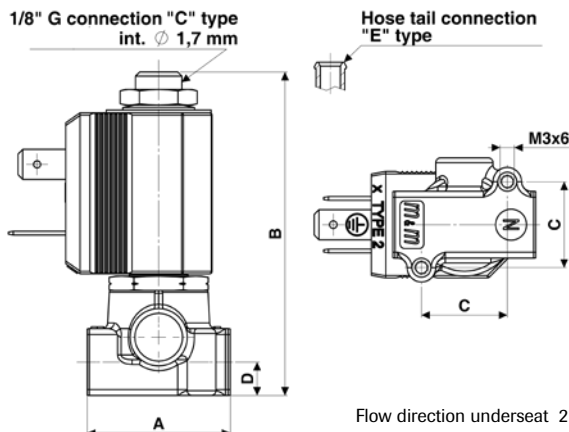
### NOTES

Valve suitable for contact with food media as per the EEC Directives and Regulations. For more specific information, please contact M&M Sales Department.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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

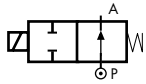


Flow direction underseat 2 → 1

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8"	30	67.8	18	7	0.15

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



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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 18va (holding)
AC 36va (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

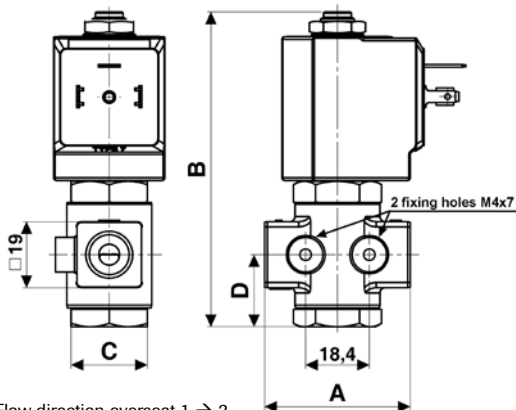
EPDM seal for air and hot water MAX 120°C (e.g. code RD236DEC)  
 High pressure version see page 28



COMPRESSED AIR

SELECTION TABLE

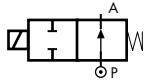
VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
RD236DVA	1/4"	1.0	0.5	0	25	25	7250	24v DC
RD236DVC	1/4"	1.5	1.3	0	20	20	7200	24v 50/60Hz
RD236DVG	1/4"	2.5	2.8	0	15	15	7400	110v 50Hz - 120v 60Hz
RD236DVH	1/4"	3.0	3.5	0	12	12	7600	200v 50Hz - 220v 60Hz
RD236DVM	1/4"	4.5	5.5	0	5	5	7700	230v 50Hz - 240v 60Hz



DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	42	91	Hex 22	20.75	0.25

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



normally open

TYPE: RD213

### 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: foodgrade FKM
- Coil power: AC 18VA (holding)  
AC 36VA (inrush)  
DC 14w
- Protection class: IP 65 (with connector)

### OPTIONS

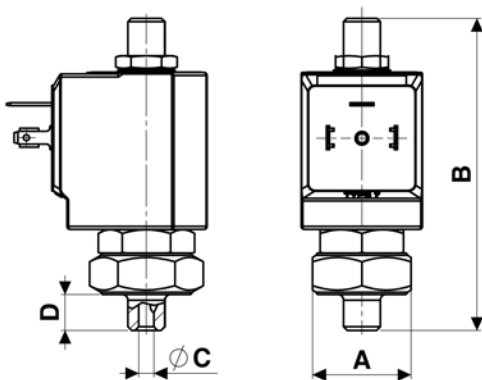
- EPDM seal for air and hot water MAX  $120^{\circ}\text{C}$  (e.g. code RD213CEG)
- Armature tube with spherical  $1/8''$  G connection (e.g. code RD213AVG)



COMPRESSED AIR

SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
RD213CVG	1/8"	2.5	2.4	0	16	16	7250	24v DC
							7200	24v 50/60Hz
							7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz

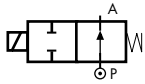


Flow direction underseat 2 → 1

DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8"	Hex 26	82.5	4	9.5	--

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



normally open

TYPE: RB214

### 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: foodgrade FKM
Coil power: AC 10va (holding)
AC 16va (inrush)
DC 7w
Protection class: IP 65 (with connector)

### OPTIONS

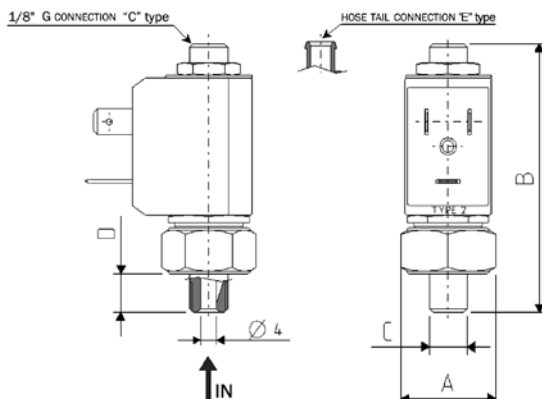
EPDM seal for air and hot water MAX 120°C (e.g. code RB214CED)
Armature tube with hose tail Ø 6 mm (e.g. code RB214EVD)
NC version available upon request (e.g. code B214EVB)



COMPRESSED AIR

SELECTION TABLE

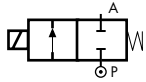
VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max ac	max dc	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
RB214CVD	1/8"	1.7	1.2	0	14	14	2250	24v DC
							2200	24v 50/60Hz
							2400	110v 50Hz - 120v 60Hz
							2600	200v 50Hz - 220v 60Hz
							2700	230v 50Hz - 240v 60Hz



DIMENSIONS & WEIGHTS

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

## 2/2 WAY DIRECT ACTING SOLENOID VALVE, FLANGE 32x32



normally closed

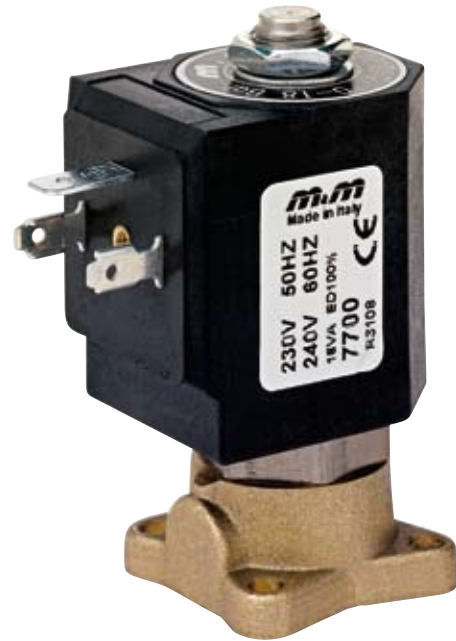
TYPE: D201

### 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 (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 18va (holding)
AC 36va (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

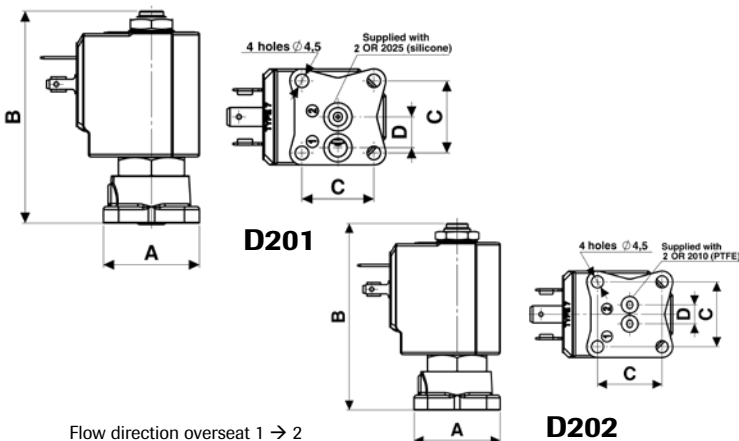
- Normally open with class "H" coils only (e.g. code RD201DVC 7701)
- Manual override (e.g. code D201DVGM)
- EPDM seal for air and hot water MAX 120°C (e.g. code D201DEC)
- Ruby seal with class "H" coils for high temperature versions up to 180°C (e.g. code D201DRG 7201)
- Version **D202** (see drawing below) available on request, minimum batch may be required



COMPRESSED AIR

SELECTION TABLE

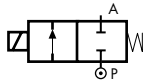
VALVE	square base	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[mm]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D201DVC	32x32	1.5	1.3	0	24	24	7250	24v DC
D201DVE	32x32	2.0	2.2	0	20	20	7200	24v 50/60Hz
D201DVG	32x32	2.5	3.4	0	18	18	7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



DIMENSIONS & WEIGHTS

Valve	A	B	C	D	weight
code	[mm]	[mm]	[mm]	[mm]	[kg]
D201	32	70.6	24	10.25	0.25
D202	32	70	24	7	0.2

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



normally closed

TYPE: D249

### 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 18VA (holding)

AC 36VA (inrush)

DC 14w

Protection class: IP 65 (with connector)

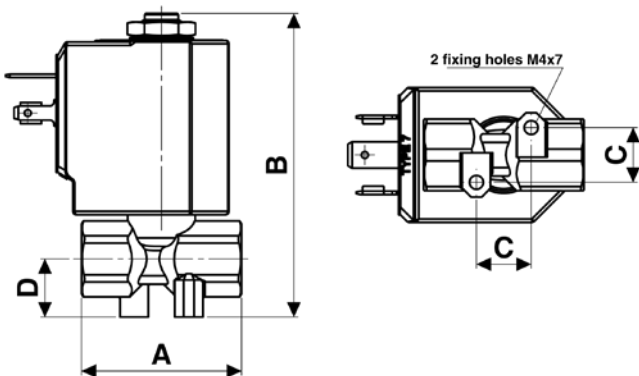
### NOTES

- A minimum batch may be required.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D249DVD	1/4"	1.7	1.5	0	25	24	7250	24v DC
D249DVF	1/4"	2.2	2.4	0	18	16	7200	24v 50/60Hz
D249DVH <sup>•</sup>	1/4"	3.0	4.5	0	10	6	7400	110v 50/60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	38	72.1	13	13.8	0.18

## AUTOMATIC DRAIN VALVE SYSTEMS

Preassembled systems consisting of solenoid valve, timer and connector for time adjusted condensate discharge of tanks with compressed air, separators, mains drainage, dryers and filters.

### TECHNICAL SPECIFICATIONS

Media: water, oil, air and inert gases

Media temperature: -10°C ÷ +130°C

Ambient temperature: -10°C ÷ +50°C

Seal material: FKM

Coil power: AC 18vA (holding)

AC 36vA (inrush)

DC 14w

Protection class: IP 65 (with connector)

Discharge time: 0,5 to 10 sec;

Interval time: 30 sec to 45 min;

Test switch: manual

### OPTIONS

UL approved timers and coils

Valve with NPT connection upon request (e.g. code D249DVFN)

Available with analog and digital timers (see page 46)

For more detailed information about the various components (solenoid valve/timer/connector), please refer to each standard datasheet



### USER BENEFITS:

- ↪ adjustable to suit your system requirements
- ↪ indoor / outdoor installations
- ↪ reliable, long life
- ↪ cost effective
- ↪ visual indication of operation
- ↪ manual override - test button

### SELECTION TABLE

ADV	Valve	G connection	nominal diameter	flow rate Kvs	OPD			Supply
					min	max AC	max DC	
code	code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	[Volts/Hz]
<b>WITH DIRECT ACTING SOLENOID VALVES</b>								
888 120 00-	D249DVF	1/4"	2.2	2.4	0	18	-	<b>SERIES 7000 COILS</b> 110v 50Hz - 120v 60Hz 230v 50Hz - 240v 60Hz 24v DC
888 121 00-					0	18	-	
888 122 00-					0	-	16	
<b>WITH PILOT OPERATED SOLENOID VALVES</b>								
888 123 00-	D264DVU	1/4"	10.5	21	0.1	16	-	<b>SERIES 7000 COILS</b> 110v 50Hz - 120v 60Hz 230v 50Hz - 240v 60Hz 24v DC
888 124 00-					0.1	16	-	
888 125 00-					0.1	-	7	
888 126 00-	D265DVU	3/8"	10.5	24	0.1	16	-	110v 50Hz - 120v 60Hz 230v 50Hz - 240v 60Hz 24v DC
888 127 00-					0.1	16	-	
888 128 00-					0.1	-	7	
888 129 00-	D266DVU	1/2"	10.5	25	0.1	16	-	110v 50Hz - 120v 60Hz 230v 50Hz - 240v 60Hz 24v DC
888 130 00-					0.1	16	-	
888 131 00-					0.1	-	7	

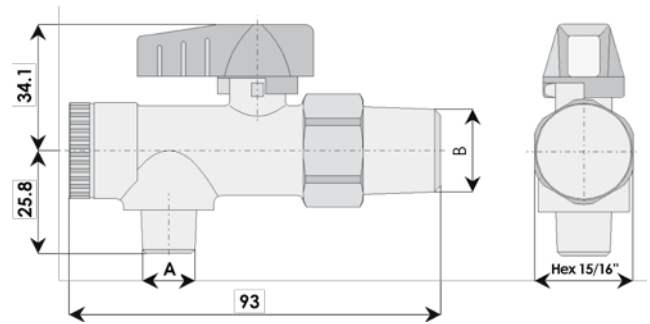


## STRAINER FOR CONDENSATE DRAIN

Strainer consisting of a ball valve with filter to be used together with the automatic drain valve. In order to clean and check the filter it is enough to close the valve to isolate it and then unscrew the plug.

### TECHNICAL SPECIFICATIONS

Media: water, oil, air, inert gases
Media temperature: -10°C ÷ +130°C
Ambient temperature: -10°C ÷ +50°C
Strainer material: brass (CW617N EN 12165)
Ball valve material: chromed brass (EN 5705-65)
Filter material: stainless steel (1.4305 EN 10088/AISI 304)
Seal material: PTFE
Strainer MAX working pressure: 50 barg
Cap for inspection and cleaning



### SELECTION TABLE

STRAINER	A	B	weight
code	[thread]	[thread]	[kg]
887 052 00-	1/2" NPT	1/2" NPT	0.23
887 053 00-	3/8" NPT	1/2" NPT	
887 054 00-	1/4" NPT	1/2" NPT	
887 057 00-	1/2" GAS	1/2" GAS	
887 058 00-	3/8" GAS	1/2" GAS	
887 059 00-	1/4" GAS	1/2" GAS	

## AUTOMATIC DRAIN VALVE SYSTEMS WITH AIR ACTUATED VALVES

Compressed air systems must be engineered to allow condensate to collect at low points, where automatic drainage should be provided.

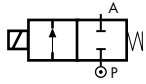
Condensate is a mixture of: water, oil and dirt, its "thickness" or viscosity increasing with low temperatures. Operating drain valves manually is time consuming and costly, and those awkward positions often get forgotten. The ADV overcomes all these problems allowing you to "tune" its operation, through the variable timers, to suit specific system conditions.

### USER BENEFITS:

- no maintenance!
- suitable for use in severe conditions
- reliable, long life
- no pressure differential required to operate



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



normally closed

HIGH PRESSURE

TYPE: D262/263

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : water, oil, liquids
Media temperature: -10°C ÷ +130°C
Ambient temperature: -10°C ÷ +50°C
Body material: brass (CW617N EN 12165)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: Ruby
Coil power: AC 25va (holding) AC 50va (inrush) DC 22w
Protection class: IP 65 (with connector)



### OPTIONS

Standard 7000 series coils may be used (AC 18va - DC 14w), however the maximum pressure rating will be reduced. For further details please contact M&M Sales Department.

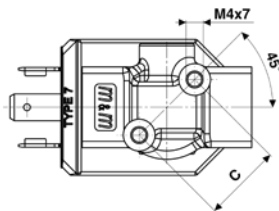
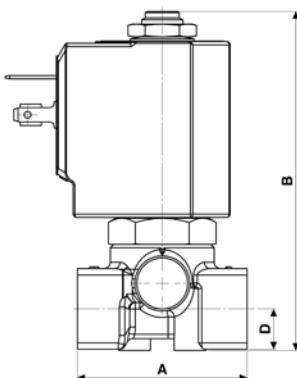
### NOTES

① Not 100% leak-proof when used with air/gases. Approximate leak rate is 1,5 ml/min at max OPD.

### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	high power - class "H"	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D262DRB1	1/8"	1.2	0.7	0	200	60	72Z1	24v DC
D262DRC1	1/8"	1.5	1.3	0	200	35	72K1	24v 50/60Hz
D262DRE1	1/8"	2.0	2.2	0	120	25	74K1	110v 50Hz - 120v 60Hz
D262DRH1	1/8"	3.0	4.5	0	50	11 <sup>ⓐ</sup>	77K1	230v 50Hz - 240v 60Hz
D263DRB1	1/4"	1.2	0.7	0	200	60		
D263DRC1	1/4"	1.5	1.3	0	200	35		
D263DRE1	1/4"	2.0	2.2	0	120	25		
D263DRH1	1/4"	3.0	4.5	0	50	11 <sup>ⓐ</sup>		

ⓐ Max OPD similar to that of the same valve when equipped with FKM seal and standard 7000 series coil (e.g. code D263DVH 7250).  
**ATTENTION:** When high pressure valves are supplied without a coil, their nameplates display the max. OPD of the valve when equipped with an AC (25va) or DC (22w) coil (as shown in the SELECTION TABLE above).  
 When using alternative coil power ratings please ensure to request separately the appropriate nameplate at time of order.

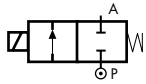


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	40	77.5	18.5	9.5	0.26

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



normally closed

HIGH PRESSURE

TYPE: D298/299

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : water, oil, liquids and aggressive fluids
Media temperature: -10°C ÷ +130°C
Ambient temperature: -10°C ÷ +50°C
Body material: stainless steel (1.4305 EN 10088/AISI 303)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: Ruby
Coil power: AC 25va (holding)
AC 50va (inrush)
DC 22w
Protection class: IP 65 (with connector)

### OPTIONS

Standard 7000 series coils may be used (AC 18va - DC 14w), however the maximum pressure rating will be reduced. For further details please contact M&M Sales Department. Also available with G 1/8" connections (e.g. code D298DRB1), performance ratings remain the same as D299.

### NOTES

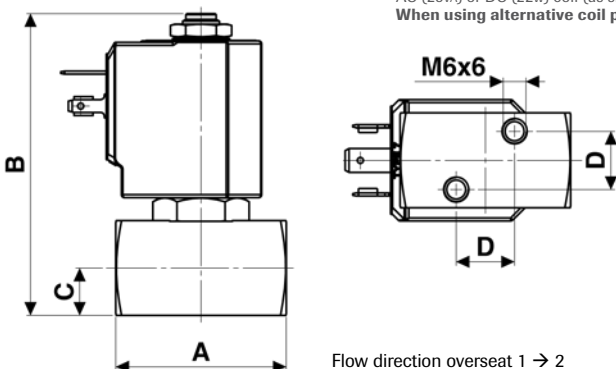
① Not 100% leak-proof when used with air/gases. Approximate leak rate is 1,5 ml/min at max OPD.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	high power - class "H"	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D299DRB1	1/4"	1.2	0.7	0	200	110	72Z1	24v DC
D299DRC1	1/4"	1.5	1.3	0	200	80	72K1	24v 50/60Hz
D299DRE1	1/4"	2.0	2.3	0	140	30	74K1	110v 50Hz - 120v 60Hz
D299DRG1	1/4"	2.5	3.4	0	90	23 <sup>②</sup>	77K1	230v 50Hz - 240v 60Hz
D299DRH1	1/4"	3.0	4.5	0	50	14 <sup>②</sup>		

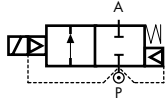
② Max OPD similar to that of the same valve when equipped with FKM seal and standard 7000 series coil (e.g. code D299DVG 7250).  
**ATTENTION:** When high pressure valves are supplied without a coil, their nameplates display the max. OPD of the valve when equipped with an AC (25va) or DC (22w) coil (as shown in the SELECTION TABLE above).  
 When using alternative coil power ratings please ensure to request separately the appropriate nameplate at time of order.



### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	45	80	12.5	15.4	0.36

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



normally closed

HIGH PRESSURE

TYPE: D634/635/636DTT1

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : water, oil, liquids
Media temperature: +10°C ÷ +130°C
Ambient temperature: -10°C ÷ +70°C
Body material: brass (CW617N EN 12165)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: PTFE
Coil power: AC 25VA (holding) AC 50VA (inrush) DC 22w
Protection class: IP 65 (with connector)

### OPTIONS

Standard 7000 series coils may be used (AC 18VA - DC 14w), however the maximum pressure rating will be reduced. For further details please contact M&M Sales Department.

### NOTES

❶ Not 100% leak-proof when used with air/gases. Approximate leak rate is 1,5 ml/min at max OPD.

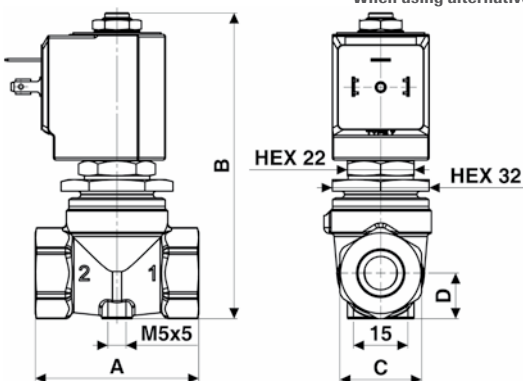


140 barg

SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	high power - class "H"	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D634DTT1	1/4"	10	21	0.3	140	35	72Z1	24v DC
D635DTT1	3/8"	10	24	0.3	140	35	72K1	24v 50/60Hz
D636DTT1	1/2"	10	25	0.3	140	35	74K1	110v 50Hz - 120v 60Hz
							77K1	230v 50Hz - 240v 60Hz

**ATTENTION:** When high pressure valves are supplied without a coil, their nameplates display the max. OPD of the valve when equipped with an AC (25VA) or DC (22w) coil (as shown in the SELECTION TABLE above).  
When using alternative coil power ratings please ensure to request separately the appropriate nameplate at time of order.

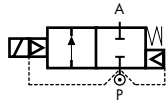


Flow direction overseat 1 → 2

DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	54	100	Hex 27	15	0.5
3/8"	54	100	Hex 27	15	0.45
1/2"	54	100	Hex 27	15	0.45

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



normally closed

HIGH PRESSURE

TYPE: D232/233/234

### TECHNICAL SPECIFICATIONS

Media:	water <sup>®</sup> , oil, air <sup>®</sup>
Media temperature:	-10°C ÷ +130°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	brass (CW617N EN 12165)
Orifice material:	stainless steel (1.4305 EN 10088/AISI 303)
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 with coils class "H" only (e.g. code RD232DTW 7701)  
FKM seal for air, water, oil MAX 130°C (e.g. code D233DVW)  
MAX OPD: 25 barg AC / DC, minimum batch may be required

### NOTES

1 Not 100% leak-proof when used with air/gases. Approximate leak rate is 1,5 ml/min at max OPD.

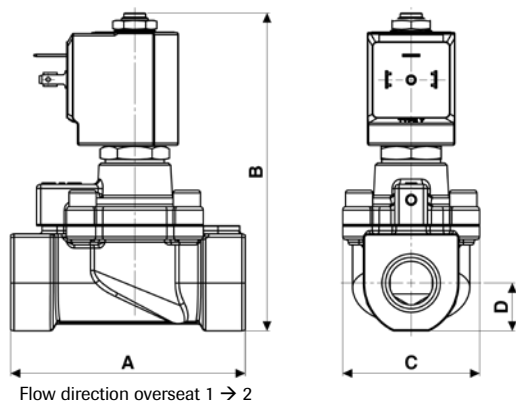
2 When using liquid fluids waterhammer and pressures higher than 20 barg can cause the diaphragm to tear (see page 49)



### ATTENTION

SELECTION TABLE

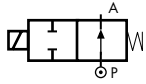
VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D232DTW	3/8"	16.5	42	1	50	50	7250	24v DC
D233DTW	1/2"	16.5	46	1	50	50	7200	24v 50/60Hz
D234DTW	3/4"	16.5	48	1	50	50	7400	110v 50Hz - 120v 60Hz
							7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
3/8"	86	116.5	50.2	17.5	1
1/2"	86	116.5	50.2	17.5	0.9
3/4"	86	116.5	50.2	17.5	0.9

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



normally open

HIGH PRESSURE

TYPE: RD236

### TECHNICAL SPECIFICATIONS

Media <sup>®</sup> : water, oil, liquids
Media temperature: -10°C ÷ +130°C
Ambient temperature: -10°C ÷ +50°C
Body material: brass (CW617N EN 12165)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: Ruby
Coil power: AC 25va (holding) AC 50va (inrush) DC 22w
Protection class: IP 65 (with connector)

### OPTIONS

Version with FKM seal on page 17

### NOTES

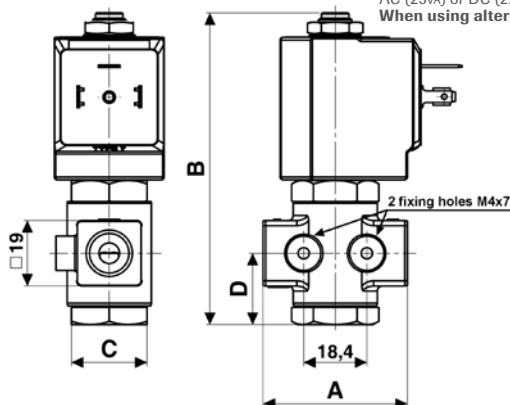
- Not 100% leak-proof when used with air/gases. Approximate leak rate is 1,5 ml/min at max OPD.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	high power & class "H" only	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
RD236DRA1	1/4"	1.0	0.5	0	180	180	72Z1	24v DC
RD236DRC1	1/4"	1.5	1.3	0	150	150	72K1	24v 50/60Hz
RD236DRE1	1/4"	2.0	2.0	0	60	60	74K1	110v 50Hz - 120v 60Hz
RD236DRG1	1/4"	2.5	2.8	0	37	37	77K1	230v 50Hz - 240v 60Hz
RD236DRH1	1/4"	3.0	3.5	0	28	28		

**ATTENTION:** When high pressure valves are supplied without a coil, their nameplates display the max. OPD of the valve when equipped with an AC (25va) or DC (22w) coil (as shown in the SELECTION TABLE above).  
When using alternative coil power ratings please ensure to request separately the appropriate nameplate at time of order.

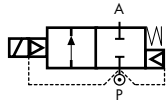


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	42	91	Hex 22	20.75	0.25

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



normally closed

STEAM VERSION

TYPE: D606/622

### TECHNICAL SPECIFICATIONS

Media °: steam
Media temperature: +80°C ° ÷ +180°C
Ambient temperature: -10°C ÷ +70°C
Body material: brass (CW617N EN 12165)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Operator seal material: PTFE
Main seal and diaphragm material: PTFE
Coil power: AC 18VA (holding)
AC 36VA (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

Normally open (e.g. code RD606DTY)

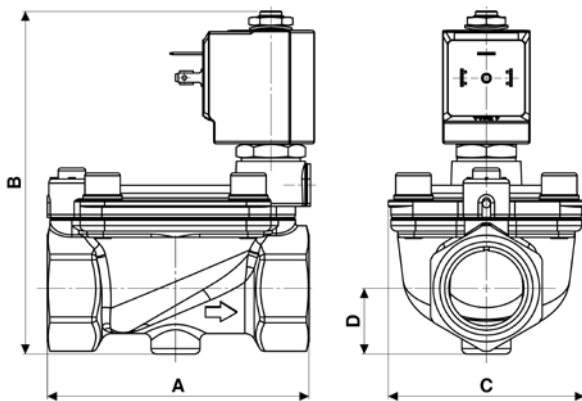
### NOTES

- Water & high content of condensate can damage the diaphragm
- To ensure correct functionality, it is important that the working temperature exceeds 80°C.



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max Ac	max Dc	class "H" only	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D606DTY	3/4"	24	120	1	9	9	7151	12v DC
D622DTY	1"	24	120	1	9	9	7251	24v DC
							7201	24v 50/60Hz
							7401	110v 50Hz - 120v 60Hz
							7601	200v 50Hz - 220v 60Hz
							7701	230v 50Hz - 240v 60Hz

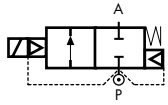


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
3/4" - 1"	96	126	72	24	1.3

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



normally closed

STEAM VERSION

TYPE: D887/888/889/890/892

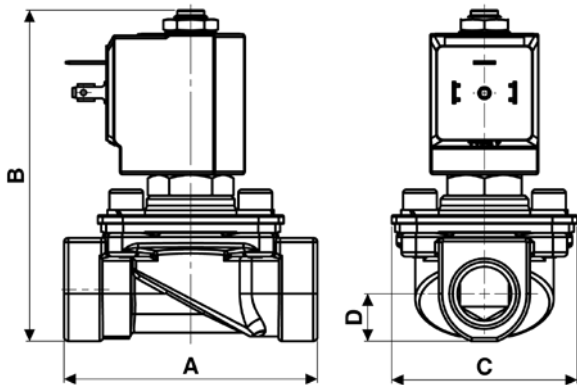
### TECHNICAL SPECIFICATIONS

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 (1.4305 EN 10088/AISI 303)
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	min	OPD max AC	max DC	COILS class "H" only	
							code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D887DPV	1/4"	11.5	35	0.3	4.5	4.5	72Z1	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



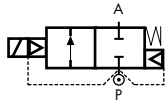
Flow direction overseat 1 → 2

DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	75	108	55	14	0.55
3/8"	75	108	55	14	0.5
1/2"	75	108	55	14	0.5
3/4"	85	108	55	21.5	0.8
1"	85	108	55	21.5	0.8



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



normally closed

STEAM VERSION

TYPE: D634/635/636

### TECHNICAL SPECIFICATIONS

Media:	water, steam
Media temperature:	+80°C ◊ ÷ +180°C
Ambient temperature:	-10°C ÷ +70°C
Body material:	brass (CW617N EN 12165)
Orifice material:	stainless steel (1.4305 EN 10088/AISI 303)
Operator material:	stainless steel
Seal material:	PTFE
Coil power:	AC 18VA (holding) AC 36VA (inrush) DC 22w
Protection class:	IP 65 (with connector)

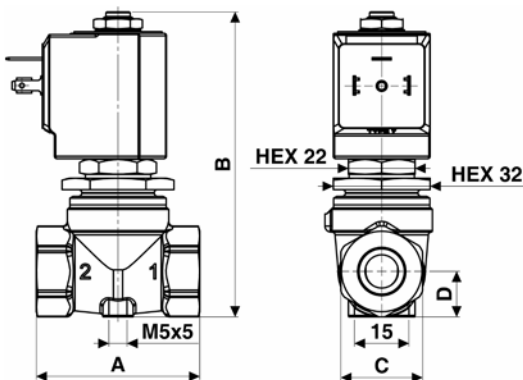
### NOTES

◊ 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	min	OPD		COILS	
					max AC	max DC	class "H" only	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D634DTT	1/4"	10	21	0.3	9	9	72Z1	24v DC
D635DTT	3/8"	10	24	0.3	9	9	7201	24v 50/60Hz
D636DTT	1/2"	10	25	0.3	9	9	7401	110v 50Hz - 120v 60Hz
							7601	200v 50Hz - 220v 60Hz
							7701	230v 50Hz - 240v 60Hz

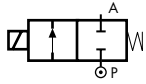


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/4"	54	100	Hex 27	15	0.5
3/8"	54	100	Hex 27	15	0.45
1/2"	54	100	Hex 27	15	0.45

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



normally closed

STEAM VERSION

TYPE: D262/263

### TECHNICAL SPECIFICATIONS

Media: steam
Media temperature: -10°C ÷ +180°C
Ambient temperature: -10°C ÷ +70°C
Body material: brass (CW617N EN 12165)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator: stainless steel
Seal material: Sigodur (filled PTFE)
Coil power: AC 18VA (holding) AC 36VA (inrush) DC 14w
Protection class: IP 65 (with connector)

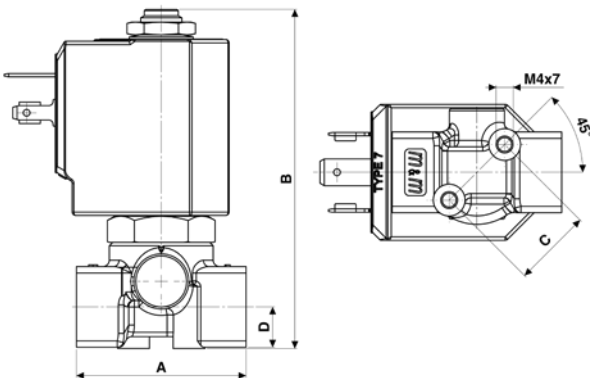
### OPTIONS

Also available with Ø 4 mm orifice (e.g. code D262DLL), Ø 5 mm orifice (e.g. code D262DLN), Ø 5,5 mm orifice (e.g. code D262DLO)  
For water, oil, air see page 11



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	class "H" only	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D262DLA	1/8"	1.0	0.5	0	9	9	7251	24v DC
D262DLC	1/8"	1.5	1.3	0	9	9	7201	24v 50/60Hz
D262DLG	1/8"	2.5	3.4	0	9	9	7401	110v 50Hz - 120v 60Hz
D262DLH	1/8"	3.0	4.5	0	9	8	7601	200v 50Hz - 220v 60Hz
D263DLA	1/4"	1.0	0.5	0	9	9	7701	230v 50Hz - 240v 60Hz
D263DLC	1/4"	1.5	1.3	0	9	9		
D263DLG	1/4"	2.5	3.4	0	9	9		
D263DLH	1/4"	3.0	4.5	0	9	8		

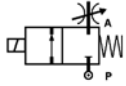


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	40	77.5	18.5	9.5	0.26

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



normally closed

WITH FLOW REGULATION - STEAM VERSION -

TYPE: D267

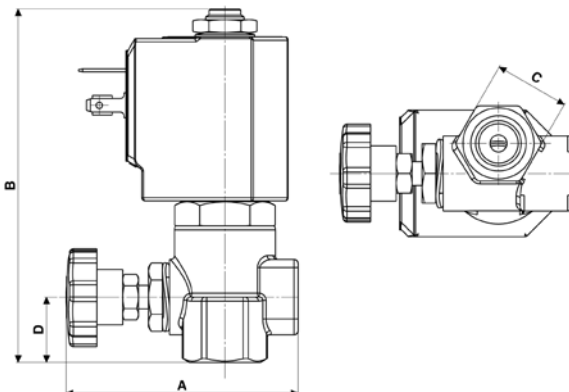
### TECHNICAL SPECIFICATIONS

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 (1.4305 EN 10088/AISI 303)
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

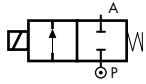
VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	class "H" only	
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D267DLE	1/4"	2.0	2.2	0	9	9	7251	24v DC
D267DLG	1/4"	2.5	3.4	0	9	9	7201	24v 50/60Hz
D267DLH	1/4"	3.0	4.5	0	9	8	7401	110v 50Hz - 120v 60Hz
D267DLL	1/4"	4.0	6.0	0	8	5	7601	200v 50Hz - 220v 60Hz
							7701	230v 50Hz - 240v 60Hz



### DIMENSIONS & WEIGHTS

VALVE	A	B	C	D	weight
code	[mm]	[mm]	[mm]	[mm]	[kg]
D267	55 ÷ 60	89.5	HEX 19	16.5	0.26

## 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 (1.4305 EN 10088/AISI 303)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 10VA (holding) AC 16VA (inrush) DC 7W
Protection class: IP 65 (with connector)

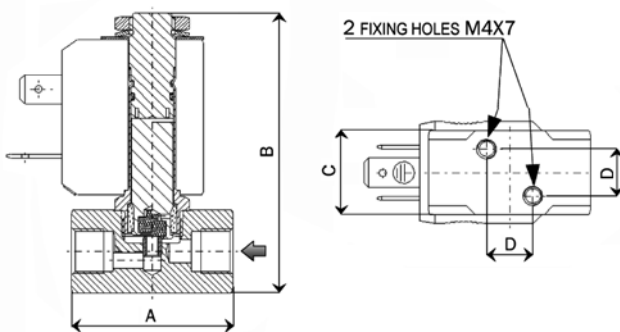
### OPTIONS

Kalrez® seal for use with aggressive fluids see page 49 (e.g. code B298DKE)



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
B298DVC	1/8"	1.5	1.0	0	22	18	2250	24v DC
B298DVE	1/8"	2.0	1.9	0	18	8	2200	24v 50/60Hz
B298DVG	1/8"	2.5	2.7	0	13	2,5	2400	110v 50Hz - 120v 60Hz
B298DVH	1/8"	3.0	3.5	0	8	1	2600	200v 50Hz - 220v 60Hz
							2700	230v 50Hz - 240v 60Hz

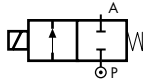


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[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 (1.4305 EN 10088/AISI 303)
Orifice material: stainless steel (1.4305 EN 10088/AISI 303)
Operator material: stainless steel
Seal material: foodgrade FKM
Coil power: AC 18vA (holding)
AC 36vA (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

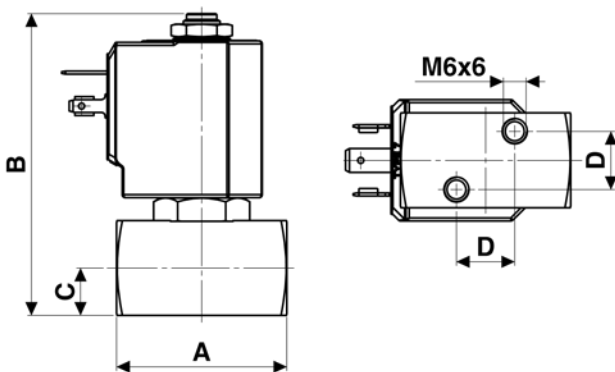
- Normally open with class "H" coils only (e.g. code RD298DVG 7701)
- Silver shading ring (e.g. code D298DVCA)
- Kalrez® seal for use with aggressive fluids see page 49 (e.g. code D298DKG)
- Steam version available (e. g. code D299DLH)
- High pressure version see page 25
- EEX proof version see page 43



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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	10	5,5		
D299DVN *	1/4"	5.0	7.5	0	5	2,5		

\* NO version not available

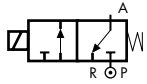


Flow direction overseat 1 → 2

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	45	80	12.5	15.4	0.36

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



normally closed

TYPE: B398

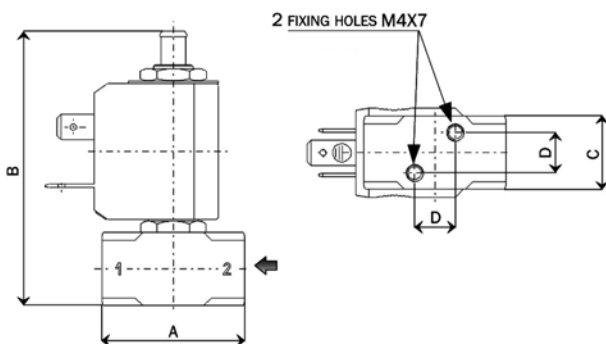
### TECHNICAL SPECIFICATIONS

Media:	water, oil, air, aggressive fluids
Media temperature:	- 10°C ÷ + 130°C
Ambient temperature:	- 10°C ÷ + 50°C
Body material:	stainless steel (1.4305 EN 10088/AISI 303)
Orifice material:	stainless steel (1.4305 EN 10088/AISI 303)
Operator material:	stainless steel
Seal material:	foodgrade FKM
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	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
B398EVB	1/8"	1.2	0.7	0	15	15	2250	24v DC
B398EVC	1/8"	1.5	1.0	0	10	10	2200	24v 50/60Hz
B398EVE	1/8"	2.0	1.9	0	5	5	2400	110v 50Hz - 120v 60Hz
B398EVG	1/8"	2.5	2.7	0	3	3	2600	200v 50Hz - 220v 60Hz
							2700	230v 50Hz - 240v 60Hz

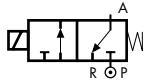


Flow direction underseat 2 → 1

### DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[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:	water, oil, air, aggressive fluids
Media temperature:	-10°C ÷ +130°C
Ambient temperature:	-10°C ÷ +50°C
Body material:	stainless steel (1.4305 EN 10088/AISI 303)
Orifice material:	stainless steel (1.4305 EN 10088/AISI 303)
Operator material:	stainless steel
Seal material:	foodgrade FKM
Coil power:	AC 18VA (holding) AC 36VA (inrush) DC 14w
Protection class:	IP 65 (with connector)

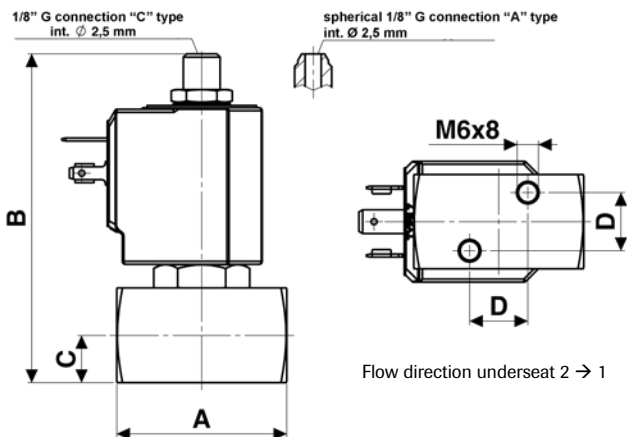
### OPTIONS

Normally open with class "H" coils only (e.g. code RD399CVH 7701)  
 Armature tube with spherical 1/8" G connection (e.g. code D398AVC)  
 Also available with Ø 4 mm orifice (e.g. code D399CVL), Ø 5,5 mm (e.g. code D399CVQ) only for NC version



### SELECTION TABLE

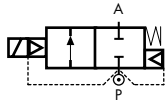
VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D398CVC	1/8"	1.5	1.3	0	18	18	7250	24v DC
D398CVE	1/8"	2.0	2.2	0	10	10	7200	24v 50/60Hz
D398CVG	1/8"	2.5	3.4	0	7	7	7400	110v 50Hz - 120v 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 G]	[mm]	[mm]	[mm]	[mm]	[kg]
1/8" - 1/4"	45	87	12.5	15.4	0.35

## 2/2 WAY PILOT OPERATED SOLENOID VALVE, G 3/8" ÷ G 1"



normally closed

TYPE: D204/205/206/222

### TECHNICAL SPECIFICATIONS

Media: water, oil, air
Media temperature: -10°C ÷ +130°C
Ambient temperature: -10°C ÷ +50°C
Body material: AISI 316L (ASME SA351/351M GRADE CF3M)
Operator material: stainless steel
Operator seal material: FKM
Seamless tube as standard, suitable for steam
Seal and diaphragm material: FKM
Silver shading ring
Coil power: AC 18vA (holding)
AC 36vA (inrush)
DC 14w
Protection class: IP 65 (with connector)

### OPTIONS

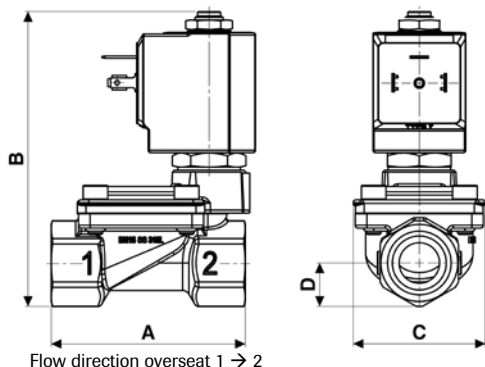
Normally open with class "H" coils only (e.g. code RD205DVZI 7251)
Manual override (e.g. code D205DBZIM)
EPDM seal for air and hot water MAX 120° C (e.g. code D204DEZI)
NBR seal for air, water, oil MAX 90° C (e.g. code D206DBYI)
NPT connection available upon request; please contact the M&M Sales Department
cUL vs UL coil upon request (e.g. code 770R) only NC version
EEX proof version see page 43

NEW!!



SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	code	[Volts/Hz]
D204DVZI	3/8"	13	55	0.3	16	16	7250	24v DC
D205DVZI	1/2"	13	63	0.3	16	16	7200	24v 50/60Hz
D206DVYI	3/4"	25	140	0.3	16	16	7400	110v 50Hz - 120v 60Hz
D222DVYI	1"	25	160	0.3	16	16	7600	200v 50Hz - 220v 60Hz
							7700	230v 50Hz - 240v 60Hz



Flow direction overseat 1 → 2

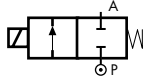
DIMENSIONS & WEIGHTS

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
3/8"	67	102	45.6	15	0.49
1/2"	67	102	45.6	15	0.49
3/4"	96	125.1	72	24	1.1
1"	96	125.1	72	24	1.1



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

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



normally closed

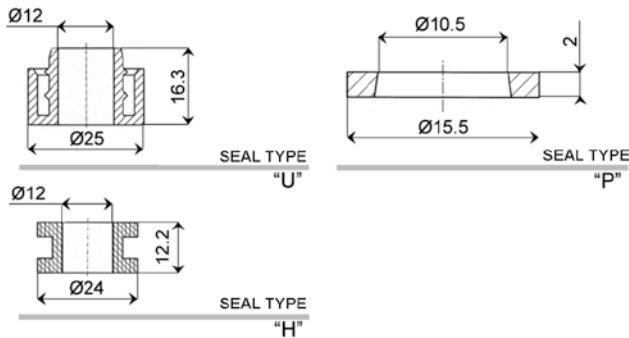
TYPE: WB251 \*

### 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 FDA listed
- Operator material: stainless steel
- Seal material: silicone FDA listed
- 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

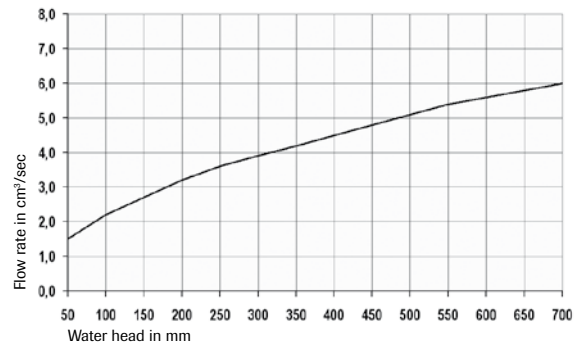


### OPTIONS



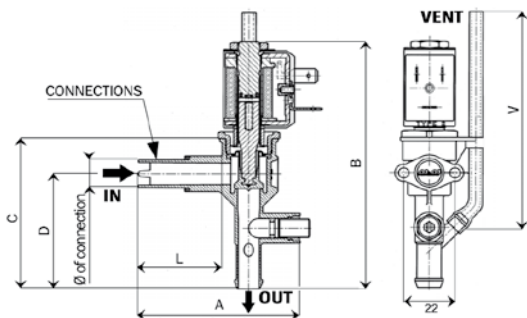
\* Product subject to phase-out, please contact M&M Sales Department for availability

### FLOW RATE CHART



### SELECTION TABLE

VALVE	type of connection	seal type	length of the vent pipe (V)	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	[mm]	-	[mm]	[barg]	[barg]	[barg]	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
WB251DSSB1	Ø 12 x L=35	"H"	95				2700	230v 50Hz - 240v 60Hz
WB251DSS12	Ø 11 x L=25	"P"	195					

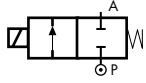


### DIMENSIONS & WEIGHTS

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: 246

### TECHNICAL SPECIFICATIONS

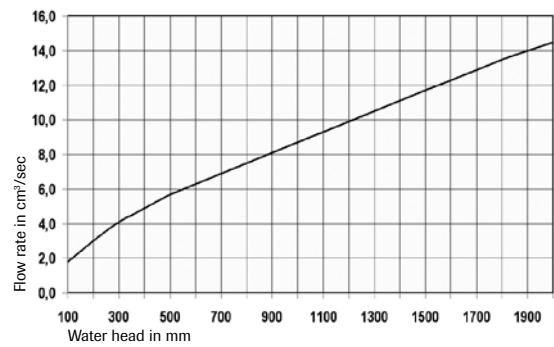
- Media: water, food and beverages
- Media temperature:  $-10^{\circ}\text{C} \div +130^{\circ}\text{C}$
- Ambient temperature:  $-10^{\circ}\text{C} \div +50^{\circ}\text{C}$
- Body material: 246DSR brass (CW617N EN 12165)
- 246DSQ natural hostaform (C13021)
- Operator material: stainless steel
- Seal material: silicone FDA listed
- 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



### OPTIONS

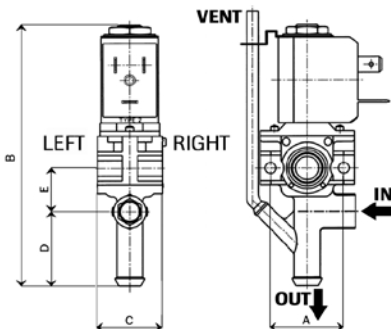
- Brass body with electroless nickel plating treatment (e.g. code 246DSK0E) minimum batch may be required
- Brass fittings available upon request, minimum batch may be required

### FLOW RATE CHART



SELECTION TABLE

VALVE	left hole	right hole	nominal diameter	OPD			COILS	
				min	max AC	max DC	code	[Volts/Hz]
code	-	-	[mm]	[barg]	[barg]	[barg]	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	7.5					
246DSQAA	open without threads	open without threads						
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						

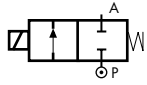


DIMENSIONS & WEIGHTS

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, G 3/8"

TOTAL SEPARATION BETWEEN INTERNAL PARTS AND MEDIUM



normally closed

TYPE: D211

### TECHNICAL SPECIFICATIONS

Media: water and beverages

Media temperature: -10°C ÷ +95°C

Ambient temperature: -10°C ÷ +50°C

Body material: brass (CW617N EN 12165)

Operator material: stainless steel

Seal material: silicone FDA listed

Coil power: AC 18VA (holding)

AC 36VA (inrush)

DC 14w

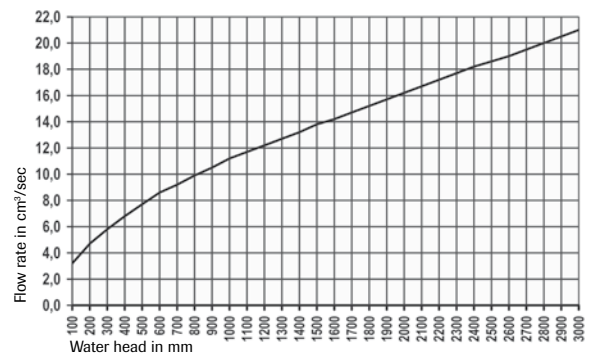
Protection class: IP 65 (with connector)

### OPTIONS

Electroless nickel plating treatment (e.g. code D211DSUK)

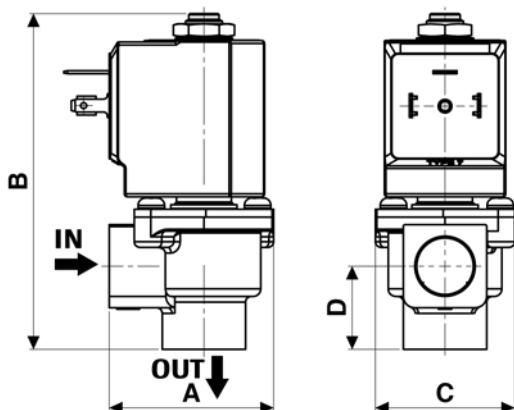


### FLOW RATE CHART \*



### SELECTION TABLE

VALVE	G connection	nominal diameter	flow rate Kvs	min	OPD		COILS	
					max AC	max DC	code	[Volts/Hz]
code	[ISO 228 G]	[mm]	[l/min]	[barg]	[barg]	[barg]	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

G connection	A	B	C	D	weight
[ISO 228 G]	[mm]	[mm]	[mm]	[mm]	[kg]
3/8"	43.4	88.8	36	22	0.340

## BESPOKE PRODUCTS

M&M are constantly evolving and developing new products, enabling us to constantly remain competitive in an ever changing market and keeping at the forefront of technological advances. For many years M&M has operated in the most diverse industrial sectors and therefore acquired vast experience with a multitude of specialist applications.

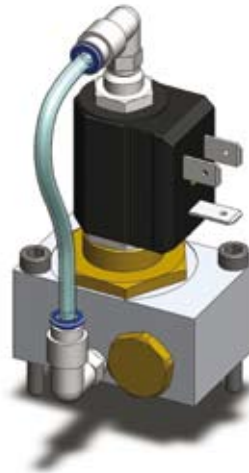
Our experience enables us to understand, design and manufacture to our customers' specific requirements.

M&M can develop new customised solenoid valve solutions according to the customers' technical requirements and needs; concentrating on increasing functionality, optimising space and reducing costs of existing systems.

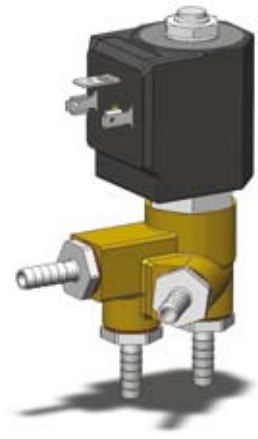
Please find below some examples:



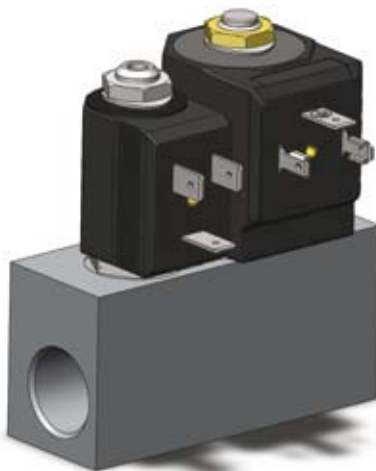
**CAR AIR CONDITIONING REFILLER**



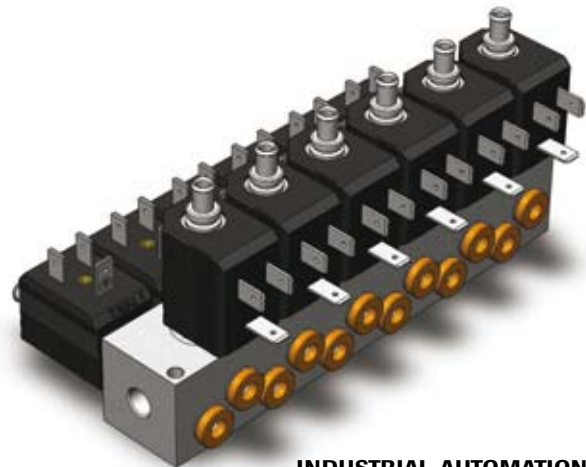
**COMPRESSED AIR TREATMENT**



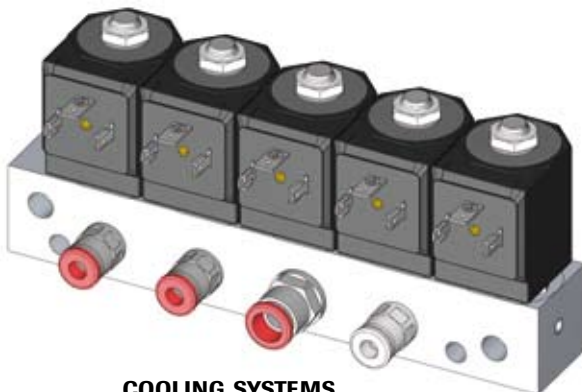
**STERILIZERS**



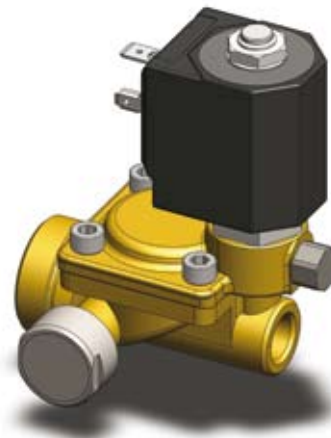
**PACKAGING WITH  
VACUUM SYSTEMS FOR INDUSTRY**



**INDUSTRIAL AUTOMATION**



**COOLING SYSTEMS**



**FIREFIGHTING SYSTEMS**

## SOLENOID VALVE FOR USE IN HAZARDOUS LOCATIONS (ATEX)

SERIES: N  

The following M&M valves can be fitted with explosion-proof operators, class EEx m II 2GD T4.

D223 - D224 - D225	⇒ see page 04
D262/263	⇒ see page 11
D362/363	⇒ see page 16
D298/D299	⇒ see page 35
D204 ÷ D222 (SS and brass)	⇒ see page 38
D326	⇒ see M&M Piston Valves Catalogue

- Assisted lift version not available
- Manual override and NO version not available
- MAX orifice available Ø 3 mm
- The ATEX operator performance is restricted to a maximum of 10 barg

### OPERATOR TECHNICAL SPECIFICATIONS

Operator material: stainless steel  
Seal material: FKM

### COILS TECHNICAL SPECIFICATIONS

Coils are supplied with a 3 m power cable only, wired on a non-removable plug  
Cable type : H05V2V2-F 3G1  
Protection class: IP 65  
Insulation class: "F" EN 60730  
Voltage tolerance: -10% ÷ +10%  
Operation: continuous  
Protection class: EEx m II 2GD T4



e. g. code D262DVC 24v DC (OPD 24 bar MAX) with ATEX operator ⇒ **N262DVC N253 (OPD 10 bar MAX)**

SELECTION TABLE

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

### SAFETY WARNING

- ① A mains fuse or equivalent means of protection (breaking value shown on the table above for each coil type) must be installed on the mains supply line. Absence of mains protection is a non conformity to safety standards (EC Directives 94/9/EC and 1999/92/EC) and is a possible cause of explosion.
- ② The Ex approval is only valid for complete solenoid valves supplied ex factory.  
Repairs may be performed by the manufacturer only (a valve is a closed system according to Directive 94/9/EC).

Special versions available upon request. Please contact the M&M Sales Department for more detailed information.

## 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: IP 65 (CEI EN60529) - NEMA 4 (UL 50) with connector and gasket

Insulation class (compliant with EN60730): "F" and "H"

Operation: continuous

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

Coil power:	AC	DC
SERIES <b>2000</b>	10VA (holding) 16VA (inrush)	7W

SERIES <b>7000</b>	18VA (holding) 36VA (inrush)	14W
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### OPTIONS

Class "H" insulation coils series 2000/7000: e.g. coil 7251

UL Approved coils series 2000/7000: e.g. coil 240R

Coil series 8000 available on request

Impregnated coils for use in damp/humid environments are available on request: e.g. coil B400 for series 2000 and D700 for series 7000. Must be used with connector and gasket (see page 45 for more information)

### NOTES

Custom voltages and low power consumption available: please contact M&M Sales Department

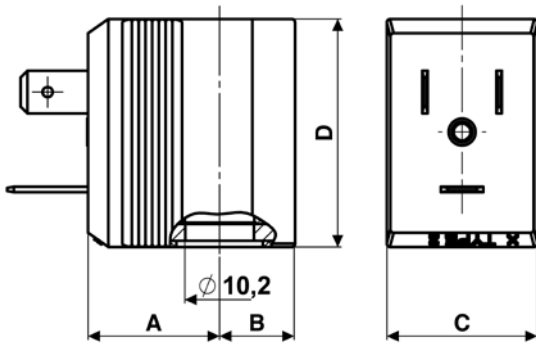
### SERIES: 2000 - 7000



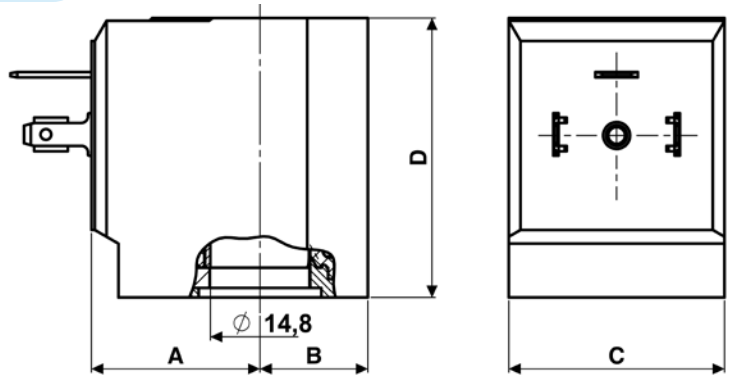
### SELECTION TABLE

CODE	voltage	power		class	ambient temp.		media temp.		ED
		holding	inrush		min	max	min	max	
2150	12V DC	7W	-	"F" 155°C	-10°C	+50°C	-10°C	+130°C	100%
2250	24V DC								
2350	48V DC								
2100	12V 50/60Hz	10VA	16VA						
2200	24V 50/60Hz								
2300	48V 50/60Hz								
2400	110V 50Hz - 120V 60Hz								
2600	200V 50Hz - 220V 60Hz								
2700	230V 50Hz - 240V 60Hz								
7150	12V DC	14W	-						
7250	24V DC								
7350	48V DC								
7100	12V 50/60Hz	18VA	36VA						
7200	24V 50/60Hz								
7300	48V 50/60Hz								
7400	110V 50Hz - 120V 60Hz								
7600	200V 50Hz - 220V 60Hz								
7700	230V 50Hz - 240V 60Hz								

## COILS - DIMENSIONS & WEIGHTS



Coil series 2000



Coil series 7000

DIMENSIONS & WEIGHTS

Series	A	B	C	D	weight
[code]	[mm]	[mm]	[mm]	[mm]	[kg]
2000	19.5	11.2	22.3	33.7	0.060
7000	25	16	32	41.4	0.146

## 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. Compliance with UL 1977 and VDE Regulations.

### 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 entry:	PG9 (6 - 8 mm)
Protection class:	IP 65 (only with gasket)
Insulation class:	group C - VDE 0110
Housing colour:	black

### OPTIONS

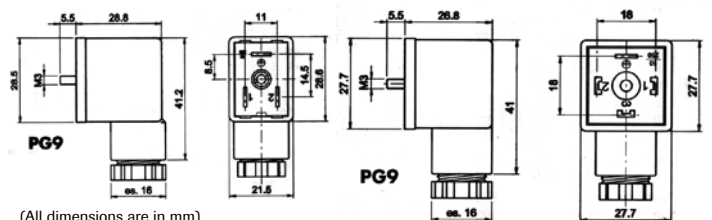
- Connectors with protection circuits
- Connectors with LED
- Connectors with flying leads

### NOTES

Connectors are supplied with thermoplastic rubber bordered gasket, fixing screw and preinstalled position with ground H 12 (the connector can be spinned when connected)

Other versions available upon request and depending on quantity: please contact M&M Sales Department.

SERIES: 600 001 00- / 600 011 00-



(All dimensions are in mm)



For coil series 2000, connector code 600 001 00-, weight: 0.019 Kg

For coil series 7000, connector code 600 011 00-, weight: 0.020 Kg

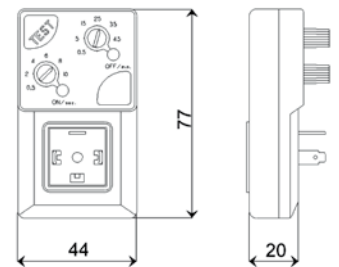
## ANALOG AND DIGITAL ELECTRONIC TIMERS

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

### ANALOG TIMER TECHNICAL SPECIFICATIONS



Supply voltage <sup>Ⓛ</sup> :	 120 ÷ 240V AC/DC - 50/60Hz (Code AT2000C02I <sup>Ⓛ</sup> )  24 ÷ 240V AC/DC - 50/60Hz
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 temp. 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

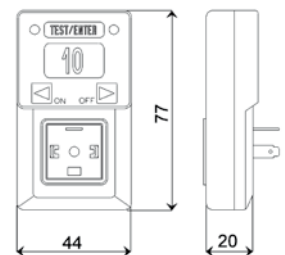


All dimensions in mm

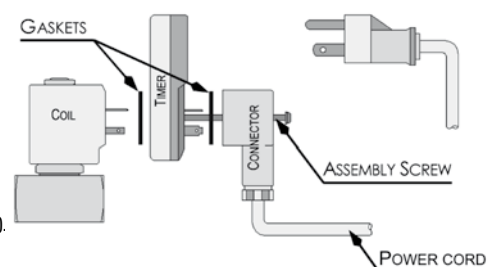
### DIGITAL TIMER TECHNICAL SPECIFICATIONS

Supply voltage <sup>Ⓛ</sup> :	 120 ÷ 240V AC/DC - 50/60Hz (Code DT3000C12I <sup>Ⓛ</sup> )  24 ÷ 240V AC/DC - 50/60Hz
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:	± 0.01%
Timing temp. 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 mm



Ⓛ In case of DC supply, polarity should be reversed: left fast-on positive (+), right fast-on negative (-). Please refer to product instructions for use.

Ⓛ  approval number E200580.

Note: Timers are supplied in single boxes with two squared gaskets and M3x50 fixing screw (see assembling scheme).



## VALVE SELECTION

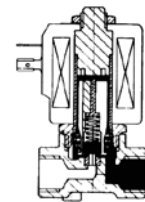
A solenoid valve should be chosen whenever the following conditions are met:

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

## VALVE TYPES

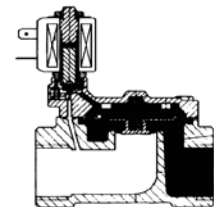
### ✓ Direct acting solenoid valves 2/2 and 3/2 way NC or NO

When energized the coil electrically generates a magnetic force attracting the armature towards the fixed core. Inside the armature is a seal that acts upon the main orifice, either when the coil is de-energised (normally closed) or when the coil is energised (normally open). By revealing the orifice allows the fluid to pass. Average response time 5 ÷ 25 ms.



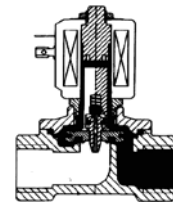
### ✓ Pilot operated solenoid valves 2/2 way NC or NO

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 datasheets. 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 datasheet (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.

The seal closing speed is operated by the adjusting screw: by screwing it clockwise (in the "+" direction) when using liquid, the valve will close slower reducing any waterhammer effect that may occur in the solenoid valve and the relative pipes.

In the case of larger valves (1 1/2" and 2"), please adjust the anti-waterhammer screw to ensure that that valve closes as fast as possible in order to avoid causing any damage that may affect the functioning of the equipment and valve due to the waterhammer effect.

## 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.

### ✓ Performances (OPD)

Pressure values shown in this catalogue are maximum pressures expressed in barg 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).

### ✓ Pressure (units of measurement)

The SI unit of pressure is the pascal (Pa), defined as 1 newton of force per square metre (1 N/m<sup>2</sup>).

As Pa is such a small unit, the kPa (1 kilonewton/m<sup>2</sup>) or MPa (1 Meganewton/ m<sup>2</sup>) tend to be more appropriate to steam engineering.

However, probably the most commonly used metric unit for pressure measurement in steam engineering is the bar. This is equal to 10<sup>5</sup> N/ m<sup>2</sup>, and approximates to 1 atmosphere. This unit is used throughout this publication.

Other units often used include lb/in<sup>2</sup> (PSI), kg/cm<sup>2</sup>, atm in H<sub>2</sub>O (atmosphere) and mm Hg. Conversion factors are readily available from many sources.

### Absolute pressure (bar a)

This is the pressure measured from the datum of a perfect vacuum: i.e. a perfect vacuum has a pressure of 0 bar a.

### Gauge pressure (bar g)

This is the pressure measured from the datum of the atmospheric pressure. Although in reality the atmospheric pressure will depend upon the climate and the height above sea level, a generally accepted value of 1.013 25 bar a (1 atm) is often used. This is the average pressure exerted by the air of the earth's atmosphere at sea level.

$$\text{Gauge pressure} = \text{Absolute pressure} - \text{Atmospheric pressure}$$

Pressure above atmospheric will always yield a positive gauge pressure. Conversely a vacuum or negative pressure is the pressure below that of the atmosphere. A pressure of -1 bar g corresponds closely to a perfect vacuum.

### ✓ Differential pressure

This is simply the difference between two pressures. When specifying a differential pressure, it is not necessary to use the suffixes 'g' or 'a' to denote either gauge pressure or absolute pressure respectively, as the pressure datum point becomes irrelevant. Therefore the difference between two pressures will have the same value whether these pressures are measured in gauge pressure or absolute pressure, as long as the two pressures are measured from the same datum.

### ✓ 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 barg 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 ± 15%.

✓ **General Information on frequently used 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).

**KALREZ**<sup>®</sup> perfluoroelastomer from DuPont, is designed specifically for the chemical process industry, combines innovative polymer and cure technology to give outstanding performance in the widest possible range of chemicals and temperatures. This product is an excellent choice to be used with acids, bases, amines, steam and many other aggressive chemicals.

✓ **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 in the datasheets 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 Department.

✓ **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 proper valve function please observe following instructions:

✓ **Water hammer or fluid hammer**

Water hammer (or, more generally, fluid hammer) is a pressure surge or wave resulting when a fluid (usually a liquid but sometimes also a gas) in motion is forced to stop or change direction suddenly (momentum change).

Water hammer commonly occurs when a valve is closed suddenly at an end of a pipeline system, and a pressure wave propagates in the pipe. It may also be known as hydraulic shock.

When using liquid fluids water-hammer can occur at pressure of 6 barg or higher.

This pressure wave can cause major problems, from noise and vibration to pipe collapse. It is possible to reduce the effects of the water hammer pulses with accumulators and other features.

Mitigating measures:

- **Air vessels** typically have an air cushion above the fluid level, which may be regulated or separated by a bladder. Sizes of air vessels may be up to hundreds of cubic meters on large pipelines.

They come in many shapes, sizes and configurations. Such vessels often are called accumulators or expansion tanks.

- **Water Hammer Arrestors** are hydropneumatic devices similar to shock absorbers that can be installed between the water pipe and the machine to absorb the shock and stop the banging.

✓ **Safety**

This product is not a safety device and must not be used as sole device to prevent the over-pressure of some parts of the plant or the containment of dangerous fluids.

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

The coil provides the basic insulation only. Install the product in a protected place to prevent electric shocks.

The coil should not be energized if it is not fitted onto a valve or without a plunger inside the valve, as it would overheat and get damaged. Do not touch the energized coil: risk of high temperature.

Do not use the tubes for conveying fluid to ground electrical devices.

Before disconnecting or disassembling the valve, make sure that there is no pressure inside the tubing or the valve itself. Accidental shocks due to fall or collision may damage the operator and/or the integrity of the coil encapsulation thus causing malfunctions such as loss of insulation, seizure of the moving parts and overheating.

#### ✓ **Installation**

Check for the operating conditions on product label and on the technical documents.

Check for compatibility between medium and valve materials. In case of doubt, please contact the manufacturer.

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.

Whilst tightening or unscrewing the valve must be held or revolved only and exclusively by the hexagon or the frame set (in order to avoid damage to its components such as coil, armature tube, etc.).

The recommended **tightening torque of the coil nut is 0,5 Nm max**, a higher torque may cause damage to the valve armature tube.

The recommended **tightening torque of the connector screw is 0,5 Nm max**, a higher torque may cause an excessive yield stress with consequent damages to the coil rivet and/or plastic encapsulation.

#### ✓ **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: care should be taken to prevent foreign bodies – dirt or material chips – from entering the valve during the assembly phase.

Use suitable seal material on the valve threads. Where liquid sealants are used, it is important to prevent them from entering the valve and block the movement.

#### ✓ **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.**

## 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".

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 the compliance of the final product with the EMC Directive.

## DECLARATION OF CONFORMITY TO CE

 A Spirax-Sarco Engineering plc company	<h3>DECLARATION OF CONFORMITY CE</h3>
<p>We, M&amp;M International S.r.l. registered office via A. Appiani 12 – 20121 Milano - Italy, declare under our sole responsibility that the products:</p> <p style="text-align: center;"><b>2/2 WAY AND 3/2 WAY DIRECT ACTING AND PILOT OPERATED SOLENOID VALVES FOR GENERAL PURPOSES</b></p> <p style="text-align: center;"><b>equipped with encapsulated coils identified by M&amp;M series "2", "7", "8", "9", "B" and "D"</b></p> <p style="text-align: center;">to which this declaration relates are in conformity with the following harmonized standards</p> <p style="text-align: center;"><b>EN 60730-1</b></p> <p style="text-align: center;"><b>EN 60529</b></p> <p style="text-align: center;">The above-referenced products comply with the essential requirements of the Directive:</p> <p style="text-align: center;"><b>2006/95/EC (ex 73/23/EC) and amendment 93/68/EC</b></p> <p style="text-align: center;">The above-referenced products are developed and constructed in compliance with the requirements of the Pressure Equipment Directive</p> <p style="text-align: center;"><b>97/23/EC, Art. 3.3 Pressure Equipment Directive</b></p> <p style="text-align: center;">Orio al Serio, Italy, April 2012</p> <p style="text-align: right;">The General Manager Maurizio Forno</p> <p style="text-align: center;"><b>ATTENTION!</b></p> <p>The attention of the purchaser, installer or user is drawn to special measures and limitations to use that must be observed when the product is used, installed or taken into service. Details of these special measures and limitations to use are available on request and are also contained in the product label and in the Installation, Maintenance and User Instructions provided together with the product.</p>	

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## TECHNICAL ENQUIRY FORM

For additional technical information please fill in this page and send it to M&M Sales Department by fax at +39 035 531763 or by e-mail at mm@mminternational.net.

✓ **Company**

-----

✓ **Name and position**

-----

✓ **Fax number**

-----

✓ **Actuator**       solenoid       pneumatic  
 ✓ **Operation**     direct act.     pilot operated  
 ✓ **Type**             2/2             3/2

assisted lift

✓ **Connections**

-----

✓ **Media temperature**

-----

✓ **Media pressure**

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

✓ **Ambient temperature**

-----

✓ **Application**

-----

✓ **Sketches or Drawings**

-----

✓ **NOTES**

-----

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

-----

✓ **Date**

-----

✓ **Address**

-----

✓ **Telephone number**

-----

✓ **E-mail address**

-----

✓ **Function**             NO     NC

✓ **Controlled media**

-----

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

-----

✓ **Flow**

-----

✓ **Electrical supply**     AC     DC

Volts ----- Frequency -----

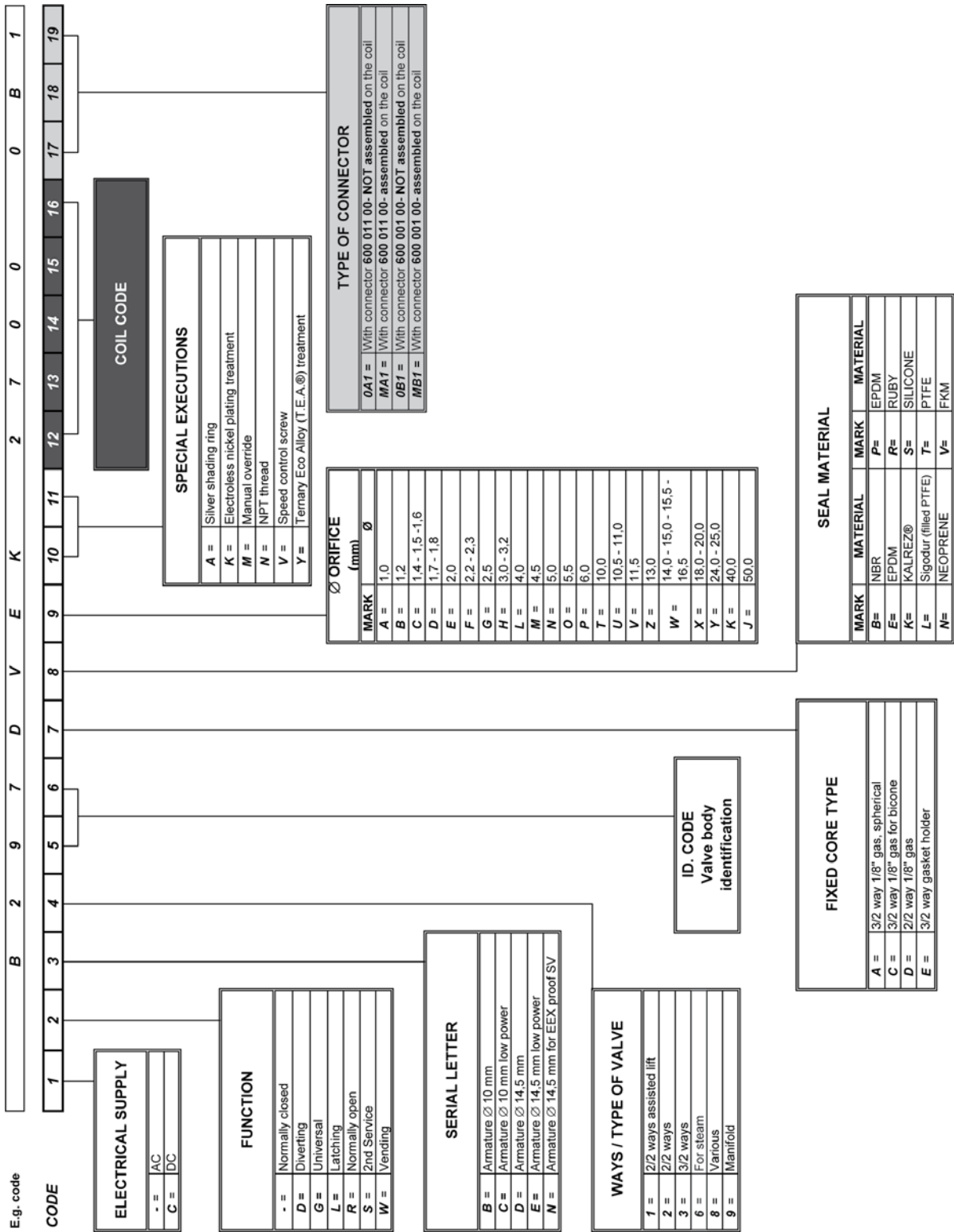
Max. Power Consumption -----

✓ **Annual quantity**

-----

✓ **Signature**

-----



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