

# Assisted lift operated 2/2-way solenoid valves

## EV250B



 **MODERN PLANT**

The Home of  
**Control & Automation**  
in Ireland

***Danfoss***

## Data sheet

# Assisted lift operated 2/2-way solenoid valves

## Type EV250B



EV250B with assisted lift can operate from zero and up to 10 bar differential pressure.

This 2/2-way valve program is especially to use in closed circuits with low differential pressure, but demanding moderate flow rates. Valve body in dezincification resistant brass for ensuring a long life even in connection with aggressive steam media.

EV250B is compatible with the broad Danfoss coil program with enclosures from IP00 up to IP67. Medium temperatures up to 140 °C (low pressure steam).

**Features and versions:**

- For water, oil, compressed air and similar neutral media
- Flow range: 0.5 – 20 m<sup>3</sup>/h
- Differential pressure: 0 – 10 bar
- Media temperature from -30 – 140 °C
- Ambient temperature: Up to 80 °C
- Coil enclosure: Up to IP67
- Thread connections: From G 3/8 – G 1
- DN 10 – 22
- Viscosity: Up to 50 cst
- The valve can be used for rough vacuum
- Water hammer damped
- DZR brass version in NC and NO
- Also available with NPT thread

## DZR brass valve body, NC



Connection ISO228/1	Seal material	Orifice size	$k_v$ - value [m <sup>3</sup> /h]	Differential pressure min. to max. [bar] / coil type <sup>3)</sup>		Media temperature min. to max. [°C]	Code number
				BB/BE 10W a.c. BG 12 W a.c. BG 20W d.c. BN 20 W a.c.	BB/BE 18W d.c. <sup>4)</sup>		
G3/8	EPDM <sup>1)</sup>	10	2.5	0 – 10	0 – 6	-30 – 140	<b>032U5250</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5251</b>
G 1/2	EPDM <sup>1)</sup>	12	4			-30 – 140	<b>032U5252</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5253</b>
G 3/4	EPDM <sup>1)</sup>	18	6			-30 – 140	<b>032U5254</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5255</b>
G 1	EPDM <sup>1)</sup>	22	7			-30 – 140	<b>032U5256</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5257</b>

<sup>1)</sup> EPDM is suitable for water.

-30 – 120 °C: 0 – 10 bar

120 – 140 °C: 0 – 4 bar

<sup>2)</sup> FKM is suitable for oil and air. For water at max. 60 °C.

<sup>3)</sup> Pressure range can be extended to use in rough vacuum, typically up to 99% vacuum (10 mbar), depending on the application.

<sup>4)</sup> 6 bar max. opening differential pressure is measured at 6% undervoltage ( 22.6 V DC hot coil), 50 °C ambient and 90 °C media temperature.

## DZR brass valve body, NO



Connection ISO228/1	Seal material	Orifice size	$k_v$ - value [m <sup>3</sup> /h]	Differential pressure min. to max. [bar] / coil type		Media temperature min. to max. [°C]	Code number
				BB/BE 10W a.c. / 18W d.c. BG 12 W a.c. / 20W d.c. BN 20 W a.c.			
G3/8	EPDM <sup>1)</sup>	10	2.5	0 – 10		-30 – 140	<b>032U5350</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5351</b>
G 1/2	EPDM <sup>1)</sup>	12	4			-30 – 140	<b>032U5352</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5353</b>
G 3/4	EPDM <sup>1)</sup>	18	4.9			-30 – 140	<b>032U5354</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5355</b>
G 1	EPDM <sup>1)</sup>	22	5.2			-30 – 140	<b>032U5356</b>
	FKM <sup>2)</sup>					0 – 100	<b>032U5357</b>

<sup>1)</sup> EPDM is suitable for water.

-30 – 120 °C: 0 – 10 bar

120 – 140 °C: 0 – 4 bar

<sup>2)</sup> FKM is suitable for oil and air. For water at max. 60 °C.

Technical data, NC and NO

Main type	EV250B 10BD	EV250B 12BD	EV250B 18BD	EV250B 22BD
Time to open [ms] <sup>1)</sup>	100	100	150	150
Time to close [ms] <sup>1)</sup>	100	100	100	100

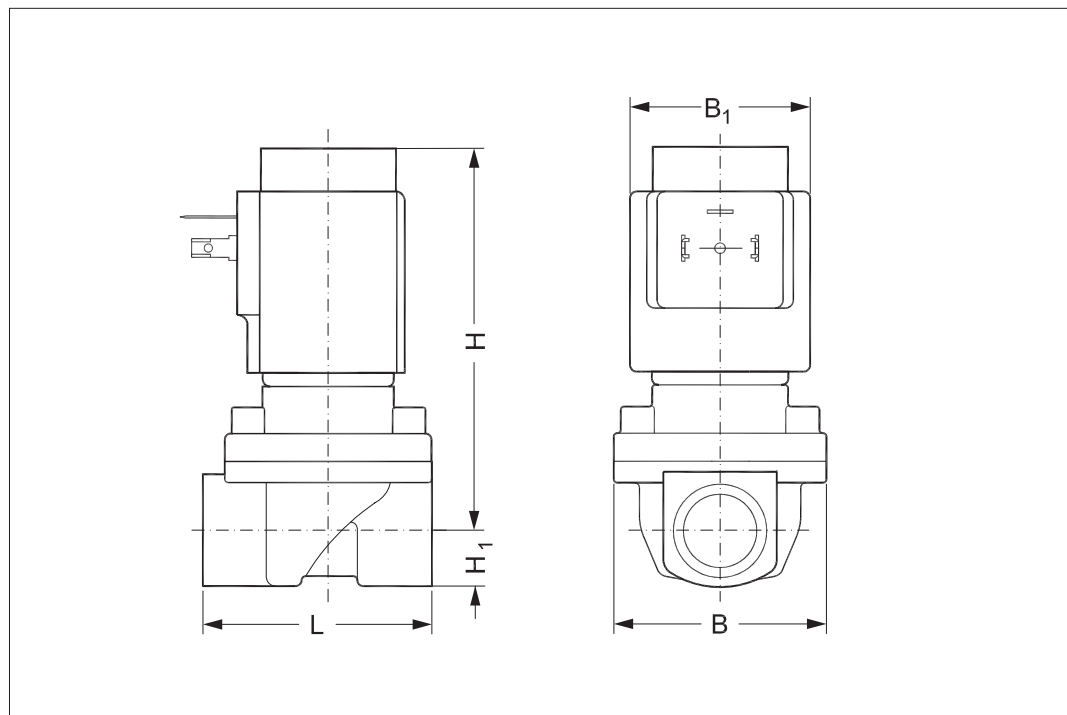
<sup>1)</sup>The times are indicative and apply to water. The exact times will depend on the pressure conditions.

Installation	Vertical solenoid system is recommended		
Max. test pressure	25 bar		
Tightness	Internally: Better than 0.4 mbar l/sec (25ccm air per min.) Externally: Better than 1* 10 <sup>-3</sup> mbar l/sec (100% He)		
Viscosity	Max. 50 cSt		
Materials	Valve body:	DZR brass	CuZn36Pb2As/CZ 132
	Cover:	Brass	W.no. 2.0402
	Armature:	Stainless steel	W.no. 1.4105 / AISI 430 FR
	Armature tube:	Stainless steel	W.no. 1.4306 / AISI 304 L
	Armature stop:	Stainless steel	W.no. 1.4105 / AISI 430 FR
	Springs:	Stainless steel	W.no. 1.4310 / AISI 301
	O-rings:	EPDM or FKM	
	Valve plate:	EPDM or FKM	
Diaphragm:	EPDM or FKM		

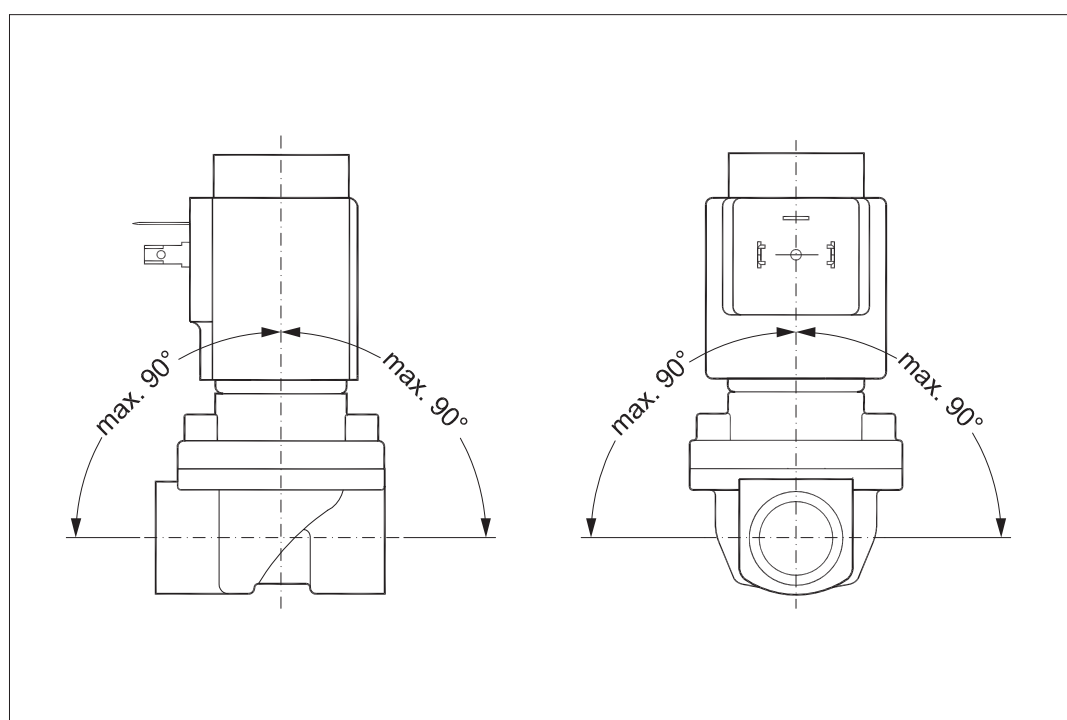
Dimensions and weight: DZR brass, NC and NO

Type	Weight gross, valve body without coil [kg]	L [mm]	B [mm]	B <sub>1</sub> [mm] / Coil type		H [mm]	H <sub>1</sub> [mm]
				BB/BE	BG/BN		
EV250B 10	0.6	58	52.3	46	68	91	12.5
EV250B 12	0.6	58	52.3	46	68	91	12.5
EV250B 18	0.8	90.5	58	46	68	92	18
EV250B 22	1.1	90	58	46	68	96.3	22.3

Dimensions



Mounting angle



Below coils can be used with EV250B:

Coil	Type	Power consumption	Enclosure	Features
	BB, clip on	10 W a.c. 18 W d.c.	IP00 with spade connector	IP20 with protective cap, IP65 with cable plug
	BE, clip on	10 W a.c. 18 W d.c.	IP67	With terminal box
	BF, clip on	10 W a.c. 18 W d.c.	IP67	With 1 m cable
	BG, clip on	12 W a.c. 20 W d.c.	IP67	With terminal box
	BN, clip on	20 W 26 VA	IP67	Hum free With terminal box and 1 m cable

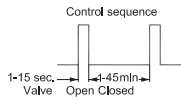
Universal electronic multi-timer, type ETM



Application	Voltage [V a.c.]	To use with coil	Ambient temperature [°C]	Code number
External adjustable timing from 1 to 45 minutes with 1 to 15 seconds drain open. With manual override (test button). Electrical connection DIN 43650 A / EN 175 301-803-A	24 – 240	BB	-10 – 50	<b>042N0185</b>

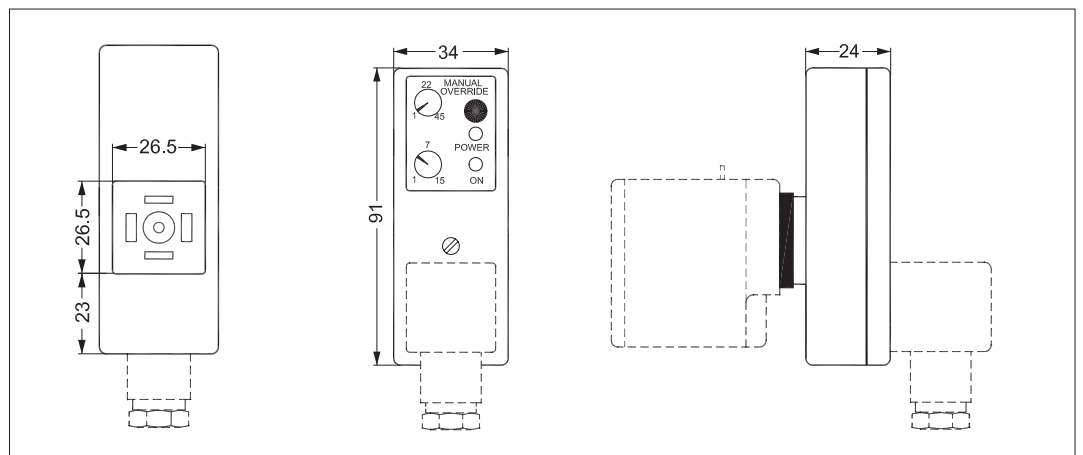
- Outside adjustments
- Light weight and small size
- External adjustable timing from 1 minute to 45 minutes with 1 to 15 seconds drain open
- One solid state timer fits all coil voltages from 24–240 V a.c
- Light diodes for indication
- All in one unit
- Manual override (test button)

Technical data



Type	ET 20 M
Voltage	24–240 V a.c / 50-60 Hz.
Power rating	Max. 20 Watt
Enclosure	IP00, IP65 with cable plug
Electrical connection	DIN connector (DIN 43650-A)
Ambient operating temperature range	-10 – 50 °C
Function	Start with pulse
Interval timer	1 – 45 min.
“On” timer	1 – 15 sec.
Weight	0.084 kg

Dimensions, ETM timer



**Spare parts kit for NC  
EPDM seal material**

For valve type	Seal material	Code number
EV250B 10 - 12BD	EPDM	<b>032U5315</b>
EV250B 18 - 22BD	EPDM	<b>032U5317</b>

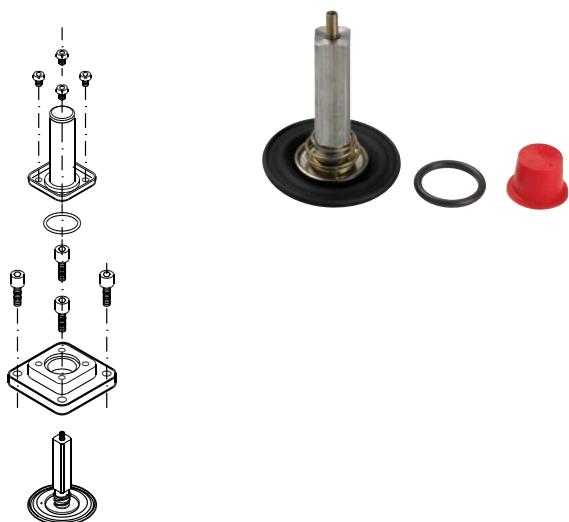


**The spare parts kit comprises:**

- O-ring for coil
- 4 screws
- Complete NC actuator unit with:
- Diaphragm
- Assist spring
- Armature
- Closing spring
- Cover
- Armature tube

**Spare parts kit for NC  
FKM seal material**

For valve type	Seal material	Code number
EV250B 10 - 12BD	FKM	<b>032U5271</b>
EV250B 18 - 22BD	FKM	<b>032U5273</b>

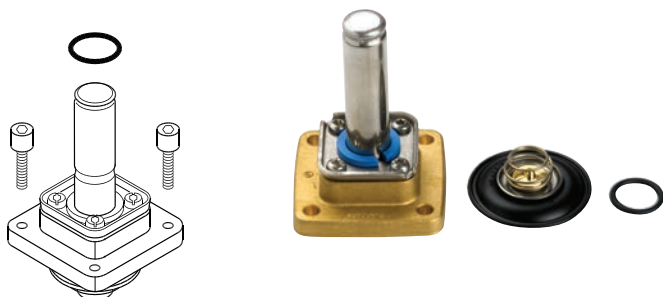


**The spare parts kit comprises:**

- O-ring
- Service element consisting of an armature with:
- Valve plate
- Spring fitted on the diaphragm

**Spare parts kit for NO**

For valve type	Seal material	Code number
EV250B 10 - 12BD	EPDM	<b>032U5319</b>
EV250B 10 - 12BD	FKM	<b>032U5320</b>
EV250B 18 - 22BD	EPDM	<b>032U5321</b>
EV250B 18 - 22BD	FKM	<b>032U5322</b>

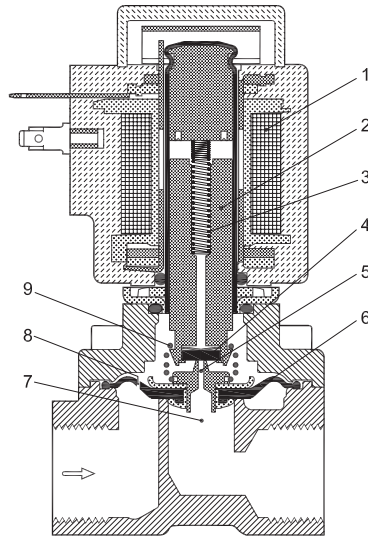


**The spare parts kit comprises:**

- O-ring for coil
- 4 screws
- Complete NO actuator unit with:
- Diaphragm
- Assist spring
- NO armature unit and cover



Function NC



1. Coil
2. Armature
3. Closing spring
4. Valve plate
5. Pilot orifice
6. Diaphragm
7. Main orifice
8. Equalizing orifice
9. Assisted lift

**Coil voltage disconnected (closed):**

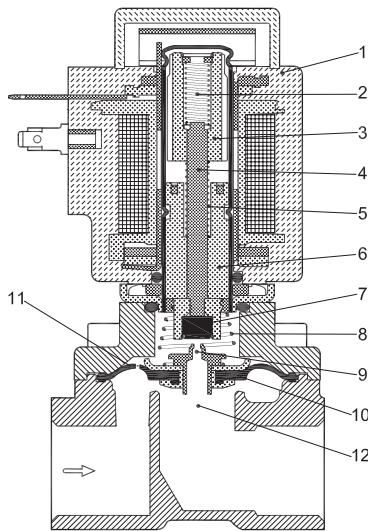
When the supply voltage to the coil (1) is disconnected, the valve plate (4) is pressed down against the pilot orifice (5) by the closing spring (3). The pressure across the diaphragm (6) is built up via the equalizing orifice (8). The diaphragm closes the main orifice (7) as soon as the pressure across the diaphragm is equivalent to the inlet pressure below, due to the larger diameter of the upper side and/or the tension of the closing spring (3). The valve will be closed as long as the voltage to the coil is disconnected.

**Coil voltage connected (open):**

When voltage is applied to the coil, the armature (2) and the valve plate (4) are lifted clear of the pilot orifice (5).

If there is a differential pressure across the valve, the pressure above the diaphragm (6) drops as the pilot orifice is larger than the equalizing orifice. Therefore the diaphragm is lifted clear of the main orifice (7). If there is no differential pressure across the valve, the armature (2) draws the diaphragm (6) clear of the main orifice (7) using the assisted lift (9). The valve will be open for as long as there is voltage to the coil.

Function NO



1. Coil
2. Closing spring
3. Armature
4. Spindle
5. Opening spring
6. Armature stop
7. Valve plate
8. Assisted lift
9. Pilot orifice
10. Diaphragm
11. Equalising orifice
12. Main orifice

**Coil voltage disconnected (valve is open):**

When the supply voltage to the coil (1) is disconnected, the valve plate (7) are lifted clear of the pilot orifice (9) if there is a differential pressure across the valve. The pressure above the diaphragm (10) drops as the pilot orifice is larger than the equalizing orifice. Therefore the diaphragm is lifted clear of the main orifice (12).

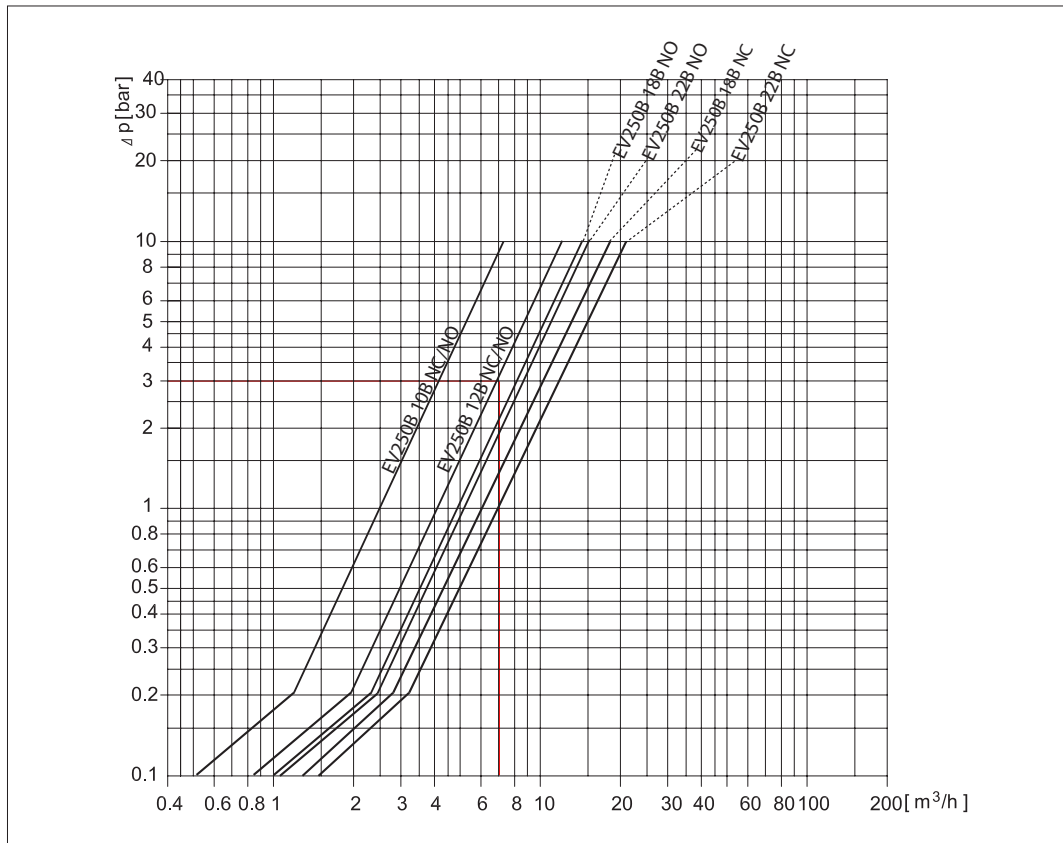
If there is no differential pressure across the valve, the opening spring (5) draws the diaphragm (10) clear of the main orifice (12) using the assisted lift (8). The valve will be open for as long as there is no voltage to the coil.

**Coil voltage connected (valve is closed):**

When the supply voltage to the coil (1) is connected, the armature (3) will compress the opening spring (5) and the closing spring will push the spindle (4)/ valve plate down against the pilot orifice (9). The pressure across the diaphragm (10) is built up via the equalising orifice (11). The diaphragm closes the main orifice (12) as soon as the pressure across the diaphragm is equivalent to the inlet pressure below, due to the larger diameter of the upper side and / or the tension of the closing spring (2). The valve will be closed as long as coil voltage is connected.

**Capacity diagram:**

Example, water: EV250B 12  
 at differential pressure of 3 bar:  
 Approx. 7 m<sup>3</sup>/h





As Ireland's official distributor for Grohe, Modern Plant stock-holds and displays a large range of Grohe Commercial and Domestic products including showers, taps, frames and accessories.



Modern Plant Ltd are an official stocking distribution centre for Emerson Rosemount industrial flow, level, pressure, analytical and temperature instrumentation products.



Modern Plant Ltd offer a wide range of Stiebel Eltron products, from instantaneous hot water heating, stored water and electric space heating solutions.



We are one of Ireland's leading suppliers of Stuart Turner pumps to suit a variety of water boosting and water transfer applications across multiple market sectors.



Modern Plant Ltd are official stocking distributors for the full range of SMC products and have a wide range of parts available from our trade counter.



Modern Plant Ltd is the sole Irish distributor for the complete Medem gas safety product range. Both companies work closely to ensure the products remain best in class.



We stock a comprehensive range of Haws AG emergency equipment. We also supply special models to the highest level of quality as well as attractive, stylish drinking fountains and water coolers.



We are the official Irish distributor for all Metso Automation valve and control products, including NELES branded flanged ball valves, rotary plug valves, segment valves, high performance off-set butterfly valves, valve actuators and much more.



We stock a large range of Bobrick washroom accessories made from type 304 stainless steel... the material of choice and quality for public washrooms.



We stock Bonfiglioli power transmission and control products, providing automation solutions for all areas of industry including the packaging, beverage, textile, food, ceramic, wood, mining and metal processing industries.



We stock tapware and shower solutions for commercial changing facilities, toilets and accessibility to people with reduced mobility in collective facilities. High tech solutions for healthcare, elderly care and laboratories.



AMG specialise in quarter turn rack and pinion pneumatic actuators with many available from stock held locally in Modern Plant.



**MODERN PLANT** For more information call 00353 1 461 4300

Modern Plant Limited, Otter House, Naas Road, Clondalkin, D 22

E: sales @ modernplant.ie, W: www.modernplant.ie