Technical
specification



ENM-10 Level regulator

FLYGT
a xylem brand

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PRODUCT DESCRIPTION

Product description

The simplest possible method for level control! A mechanical switch in a plastic casing, freely suspended at the desired height from its own cable. When the liquid level reaches the regulator, the casing will tilt and the mechanical switch will close or break the circuit, thereby starting or stopping a pump or actuating an alarm device. No wear, no maintenance! In sewage pumping stations, for ground water and drainage pumping – in fact, for most level control applications – the ENM-10 is the ideal solution.

The regulator casing is made of polypropylene and the cable is sheathed with a special PVC or Nitrile/PVC rubber compound. The plastic components are welded and screwed together. Adhesive is never used. Impurities and deposits will not adhere to the smooth casing.

This level regulator is available in different versions, depending upon the medium in which it is to be used. As standard, the regulator can be obtained with 6, 13, 20, 30 or 50 metres (20, 42, 65, 100 or 167 feet) of cable for liquids with specific density between 0.95 and 1.10 g/cm3; for other specific densities and for the Ex-version, the regulator is only available with 20 metres (65 ft) of cable. The regulator can withstand up to 60°C (140°F).

Technical data

Liquid temperature:	min. 0°C (32°F) max. 60°C (140°F)
Liquid density:	min. 0.65 g/cm^3 max. 1.5 g/cm^3
Degree of protection:	IP68, 20 m (65 ft)
Interrupting capacity of micro switch:	AC, resistive load, 250V 10A AC, inductive load, 250V 3A cos ϕ = 0.5 DC, 30V 5A
With gold plated micro switch:	same as above, except: DC, 24V 10mA

Note that local regulations may limit the voltage.

Materials

Body:	Body:
Bending relief:	EPDM rubber
Cable:	special compound PVC or NBR/PVC nitrile/PVC rubber

Dimensions

Table 1

For density g/cm^3	Regulator length mm (in.)	Diameter mm (in.)
0.65–0.80	194 (7 10/16)	100 (4)
0.80–0.95	177 (7)	100 (4)
0.95–1.10	162 (6 3/8)	100 (4)
1.05–1.20	142 (5 9/16)	100 (4)
1.20–1.30	133 (5 1/4)	100 (4)

For density g/cm^3	Regulator length mm (in.)	Diameter mm (in.)
1.30–1.40	130 (5 2/16)	100 (4)
1.40–1.50	126 (5)	100 (4)

Weight: approx. 2 kg (4.5 lb) for a standard density regulator with 20 m cable.

Approvals: CE, CSA, SEMKO, NEMKO, DEMKO

LVD approval according to EN61058

CSA approval: Cert no. 1330172

Cl.I Zone 0, Gr. IIC;

CL.I Div.1 Gr A, B, C&D;

Cl.II Gr. E, F&G;

Cl.III when installed to the certified Intrinsically Safe relay, Ex ia, rated for the locations per submitter controll drawing and installation manual.

Intrincically safe circuits are required for the automatic control system. - Use a EX-safety barrier (e.g. Prod. no. 84 01 07).

0080

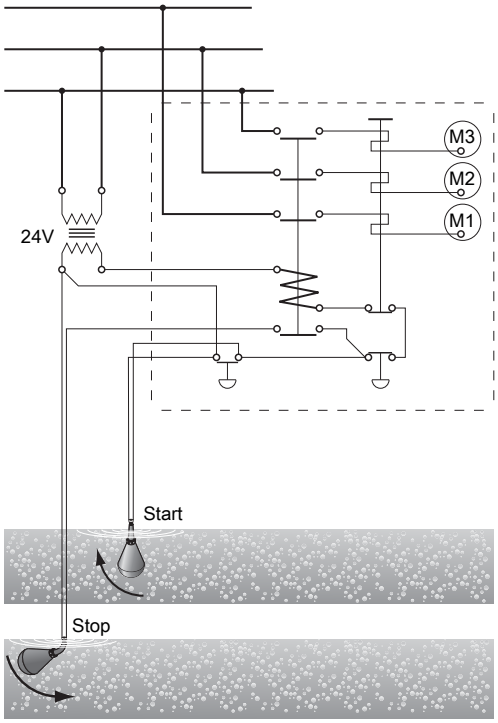
Figure 1

Wiring alternative

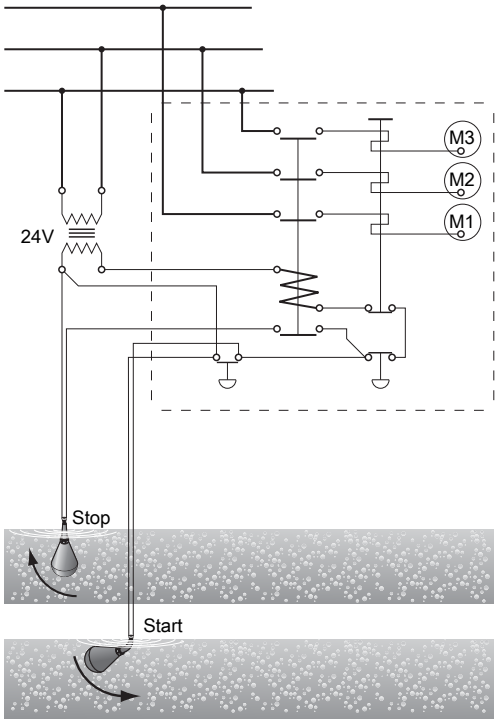
To conform to local regulations, the level regulators are normally connected through a transformer to a low-tension control circuit.

Two regulators are used; one for starting and one for stopping. A third regulator can be connected if an alarm is required at a given level.

Identical regulators can be used for all functions.



Connect the gray and black leads.



Connect the gray and brown leads.

Insulate the brown lead.
Figure 2: Connected for emptying

Insulate the black lead.
Figure 3: Connected for emptying

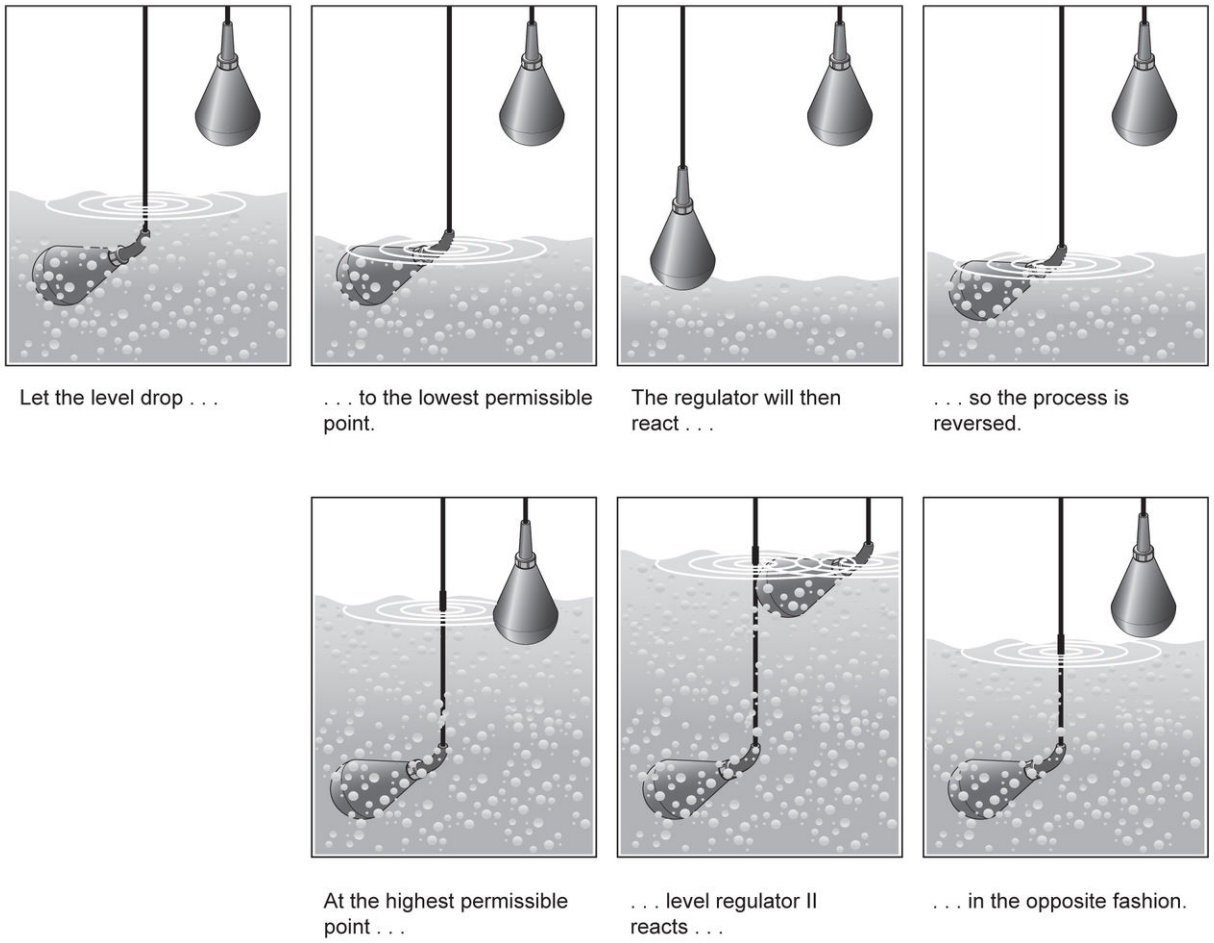


Figure 4

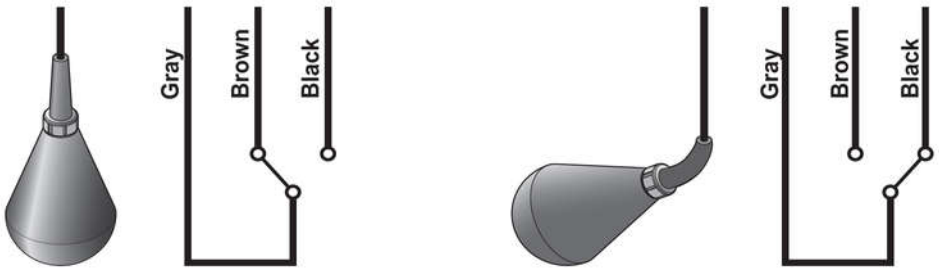


Figure 5: Colour code

Maintenance and repair

ENM-10 is very durable and practically maintenance free. You only have to check on it occasionally, to ensure its continual operation.

- It is recommended to occasionally clean ENM-10, and especially when fat/grease covers the plastic surface.
- At the same time, make an occular inspection of the regulator to make sure neither cable, protective sleeve or plastic casing show any signs of damage.

- A damaged ENM-10 cannot be repaired in any way, due to the hermetic encapsulation. If the unit is found to be damaged, replace it with a new one.
- For Ex-installations, also make absolutely sure that the Ex-barrier (e.g. Prod. no. 84 01 07) is operating correctly - The LED changes when the switch is toggled.

The manufacturers reserve the right to alter performance specification or design without notice.

CHEMICAL RESISTANCE LIST

Chemical resistance list

The liquid in which level regulation is practiced most frequently is, of course, water. Of the millions of regulators in use all over the world today, it is estimated that nine out of ten work in water.

However, with a float body of polypropylene, a cable of PVC or NBR/PVC nitrile/PVC rubber and a bending relief of EPDM rubber, the ENM-10 is virtually insensitive to many aggressive liquids.

The table shows how resistant the ENM-10 equipped with either PVC or NBR/PVC nitrile/PVC rubber cable, is to different chemicals at two different temperatures.

The classification is broken down into the following categories:

0 = No effect, 1 = Minor to moderate and 2 = Severe effect. The sign – means that information is not available.

Keep in mind also that the density of the liquid determines the bouyancy of the regulator. The ENM-10 is made for seven different densities. See *Product description* (page 2).

Always observe local regulations:

Take particular note of:

- risk of fire/explosion
- hygiene requirements

Acids	PVC cable		NBR/PVC nitrile/PVC rubber cable	
	20°C (68°F)	60°C (140°F)	20°C (68°F)	60°C (140°F)
Acetic Acid 50%	1	2	0	0
Acetic Acid 75%	2	2	0	0
Benzoic Acid	2	2	0	0
Boric Acid 5%	0	—	0	0
Butyric Acid	2	2	2	2
Chromic Acid 10%	0	2	2	2
Citric Acid	0	1	0	0
Hydrobromic Acid 5%	1	2	0	0
Hydrochloric Acid 10%	0	1	0	1
Hydrochloric Acid 37%	1	2	0	2
Hydrocyanic Acid 10%	0	0	1	2
Hydrofluoric Acid 5%	0	2	0	1
Hypochloric Acid	1	2	2	2
Maleic Acid	2	2	2	2
Nitric Acid 5%	1	1	1	1
Nitric Acid 65%	2	2	2	2
Oleic Acid	1	2	2	2
Oxalic Acid 50%	1	1	1	2
Phosphoric Acid 25%	0	0	1	2
Phosphoric Acid 85%	0	0	1	2
Sulphuric Acid 10%	1	2	1	2
Sulphuric Acid 78%	2	2	2	2
Tannic Acid	0	0	0	0
Tartaric Acid	1	1	1	1
Bases				
Ammonium Hydroxide	0	—	0	0
Calcium Hydroxide	0	0	0	0
Potassium Hydroxide	1	2	0	0
Sodium Hydroxide	1	2	0	0

Salts	PVC cable		NBR/PVC nitrile/PVC rubber cable	
	20°C (68°F)	60°C (140°F)	20°C (68°F)	60°C (140°F)
Aluminium Chloride	0	0	0	0
Calcium Sulphate	0	0	0	0
Calcium Chloride	0	0	0	0
Calcium Nitrate	0	0	0	0
Copper Chloride	0	0	0	0
Copper Sulphate	0	0	0	0
Ferric Chloride	0	0	0	0
Ferrous Sulphate	0	0	0	0
Magnesium Chloride	0	0	0	0
Potassium Sulphate	0	0	0	0
Potassium Nitrate	0	0	0	0
Potassium Carbonate	1	1	1	1
Potassium Bicarbonate	0	0	0	0
Sodium Sulphate	0	0	0	0
Sodium Chloride	0	0	0	0
Sodium Nitrate	0	0	0	0
Sodium Bicarbonate	0	0	0	0
Sodium Carbonate	0	0	0	0
Tin Chloride	1	1	1	1
Zinc Sulphate	0	0	0	0
Zinc Chloride	0	0	0	0
Oils				
Castor Oil	1	1	1	1
Cocoanut Oil	0	—	0	2
Corn Oil	2	2	2	2
Diesel Oil	2	2	2	2
Linseed Oil	2	2	2	2
Mineral Oils	2	2	2	2
Olive Oil	1	1	1	1
Silicone Oils	0	0	0	0

Solvents and miscellaneous	PVC cable		NBR/PVC nitrile/PVC rubber cable	
	20°C (68°F)	60°C (140°F)	20°C (68°F)	60°C (140°F)
Aceton	2	2	2	2
Aniline	2	2	1	2
Benzene	2	2	2	2
Butyl Alcohol	2	2	0	1
Carbon Tetrachloride	2	2	2	2
Chlorobenzene	2	2	2	2
Chloroform	2	2	2	2
Ethyl Alcohol	2	2	0	1
Ethyl Ether	2	2	2	2
Ethyl Acetate	2	2	2	2
Ethylene Dichloride	2	2	2	2
Ethylene Chloride	2	2	2	2
Formaldehyde 37%	1	2	0	0
Gasoline	2	2	2	2
Kerosene	2	2	2	2
Methyl Alcohol	2	2	0	0
Methyl Ethyl Ketone	2	2	2	2
Methylene Chloride	2	2	2	2
Nitrobenzene	2	2	2	2
Phenol	2	2	2	2
Toluene	2	2	2	2
Trichlorethylene	2	2	2	2
Turpentine	2	2	2	2
Xylene	2	2	2	2
Gases				
Carbon Dioxide	0	0	0	0
Carbon Monoxide	0	0	0	0
Chlorine (wet)	2	2	2	2
Hydrogen Sulphide	0	0	1	1
Sulphur Dioxide (wet)	1	1	2	2

0 = No effect, 1 = Minor to moderate, 2 = Severe effect. – = No information available.

Figure 6

PRODUCT RANGE

Product range

Part no.	For density [g/cm³]	Color of level switch	Type of cable	Cable length [m]	Approvals	For market	Notes
5828800	0,65-0,80	Blue	1	20	CE		
5828801	0,80-0,95	Blue	1	20	CE		
5828802	0,95-1,10	Blue	1	6	CE		
5828803	0,95-1,10	Blue	1	13	CE		
5828804	0,95-1,10	Blue	1	20	CE		
5828805	1,05-1,20	Blue	1	20	CE		
5828806	1,2-1,3	Blue	1	20	CE		
5828807	1,3-1,4	Blue	1	20	CE		
5828808	1,4-1,5	Blue	1	20	CE		
5828809	0,65-0,80	Grey	5	20	CSA/CE	Canada	
5828810	0,80-0,95	Grey	5	20	CSA/CE	Canada	
5828811	0,95-1,10	Grey	5	6	CSA/CE	Canada	
5828812	0,95-1,10	Grey	5	13	CSA/CE	Canada	
5828813	0,95-1,10	Grey	5	20	CSA/CE	Canada	
5828814	1,05-1,20	Grey	5	20	CSA/CE	Canada	
5828815	1,2-1,3	Grey	5	20	CSA/CE	Canada	
5828816	1,3-1,4	Grey	5	20	CSA/CE	Canada	
5828817	1,4-1,5	Grey	5	20	CSA/CE	Canada	
5828818	0,65-0,80	Grey	1	20	CSA/CE	Canada	
5828819	0,80-0,95	Grey	1	20	CSA/CE	Canada	
5828820	0,95-1,10	Grey	1	6	CSA/CE	Canada	
5828821	0,95-1,10	Grey	1	13	CSA/CE	Canada	
5828822	0,95-1,10	Grey	1	20	CSA/CE	Canada	
5828823	1,05-1,20	Grey	1	20	CSA/CE	Canada	
5828824	1,2-1,3	Grey	1	20	CSA/CE	Canada	
5828825	1,3-1,4	Grey	1	20	CSA/CE	Canada	
5828826	1,4-1,5	Grey	1	20	CSA/CE	Canada	
5828827	0,65-0,80	Blue	2	20	CE	USA	
5828828	0,80-0,95	Blue	2	20	CE	USA	
5828829	0,95-1,10	Blue	2	6	CE	USA	
5828830	0,95-1,10	Blue	2	13	CE	USA	
5828831	0,95-1,10	Blue	2	20	CE	USA	
5828832	1,05-1,20	Blue	2	20	CE	USA	
5828833	1,2-1,3	Blue	2	20	CE	USA	
5828834	1,3-1,4	Blue	2	20	CE	USA	
5828835	1,4-1,5	Blue	2	20	CE	USA	
5828836	0,95-1,10	Grey	5	30	CSA/CE	Canada	
5828837	0,95-1,10	Grey	5	50	CSA/CE	Canada	
5828838	0,95-1,10	Grey	5	100	CSA/CE	Canada	
5828839	0,95-1,10	Grey	5	150	CSA/CE	Canada	
5828851	0,95-1,10	Red	3	65	CE		
5828852	0,95-1,10	Red	3	6	CE		
5828853	0,95-1,10	Red	3	13	CE		
5828854	0,95-1,10	Red	3	20	CE		
5828855	0,95-1,10	Red	3	6	CSA/CE	Canada	
5828856	0,95-1,10	Red	3	13	CSA/CE	Canada	
5828857	0,95-1,10	Red	3	20	CSA/CE	Canada	

Cont. →

Figure 7

5828858	0,95-1,10	Red	4	6	CE	USA	
5828859	0,95-1,10	Red	4	13	CE	USA	
5828860	0,95-1,10	Red	4	20	CE	USA	
5828870	0,65-0,80	Blue	5	20	CE		
5828871	0,80-0,95	Blue	5	20	CE		
5828872	0,95-1,10	Blue	5	6	CE		
5828873	0,95-1,10	Blue	5	13	CE		
5828874	0,95-1,10	Blue	5	20	CE		
5828875	1,05-1,20	Blue	5	20	CE		
5828876	1,2-1,3	Blue	5	20	CE		
5828877	1,3-1,4	Blue	5	20	CE		
5828878	1,4-1,5	Blue	5	20	CE		
5828879	0,95-1,10	Blue	1	65	CE		
5828880	0,95-1,10	Blue	1	30	CE		
5828881	0,95-1,10	Blue	1	50	CE		
5828882	0,95-1,10	Grey	1	30	CSA/CE	Canada	
5828883	0,95-1,10	Grey	1	50	CSA/CE	Canada	
5828884	0,95-1,10	Blue	2	30	CE	USA	
5828885	0,95-1,10	Blue	2	50	CE	USA	
5828886	0,95-1,10	Red	3	30	CE		
5828887	0,95-1,10	Red	3	50	CE		
5828890	0,95-1,10	Blue	5	30	CE		
5828891	0,95-1,10	Blue	5	50	CE		
5828892	0,95-1,10	Red	3	6	CE	Japan	
5828893	0,95-1,10	Red	3	13	CE	Japan	
5828894	0,95-1,10	Red	3	20	CE	Japan	
5828895	0,95-1,10	Blue	1	6	CE	Japan	
5828896	0,95-1,10	Blue	1	13	CE	Japan	
5828897	0,95-1,10	Blue	1	20	CE	Japan	
5828898	0,95-1,10	Blue	1	50	CE	Japan	
5947919	0,95-1,10	Blue	5	20	CE		Designed for low current and slow movements
5947920	0,95-1,10	Grey	5	20	CSA/CE		Designed for low current and slow movements

Type of cable:

1. Blue PVC jacket with color coding of wires: Grey/Brown/Black
2. Blue PVC jacket with color coding of wires: Red/White/Black
3. Red PVC jacket with color coding of wires: Grey/Brown/Black
4. Red PVC jacket with color coding of wires: Red/White/Black
5. BLACK NBR/PVC jacket with color coding of wires: Grey/Brown/Black (NBR=Nitrile rubber)

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2) A leading global water technology company

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