Technical
specification

ENM-10 Level regulator

FLYGT
a xylem brand

Table of Contents

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:	Polypropylene
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, EX

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 control drawing and installation manual.: CE, CSA, SEMKO, NEMKO, DEMKO

Ex approval

IECEx ia IIC T4 Ga: -20°C < Ta < 60°C

IECEx NEMKO 09.008

ATEX II 1G ia IIC T4

NEMKO 10ATEX 1082

The applied standards are:

EN 60079-0:2009/IEC 60079-0:2007

EN 60079-11:2007/IEC 60079-0:2006

EN 60079-26:2007/IEC 60079-26:2006

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

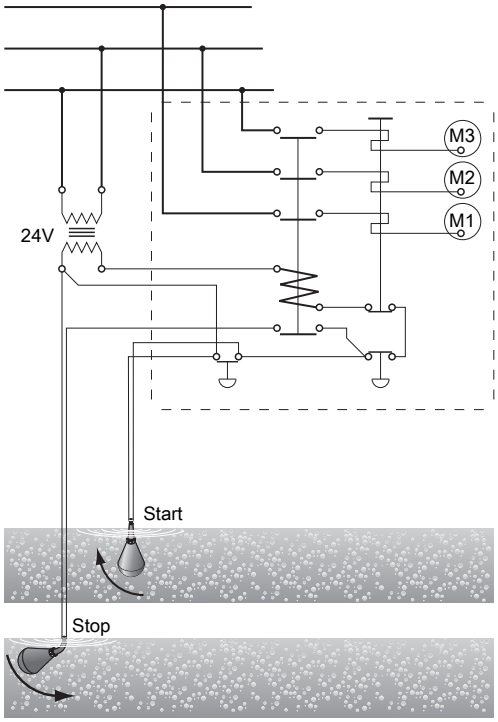
Figure 1

Wiring alternative

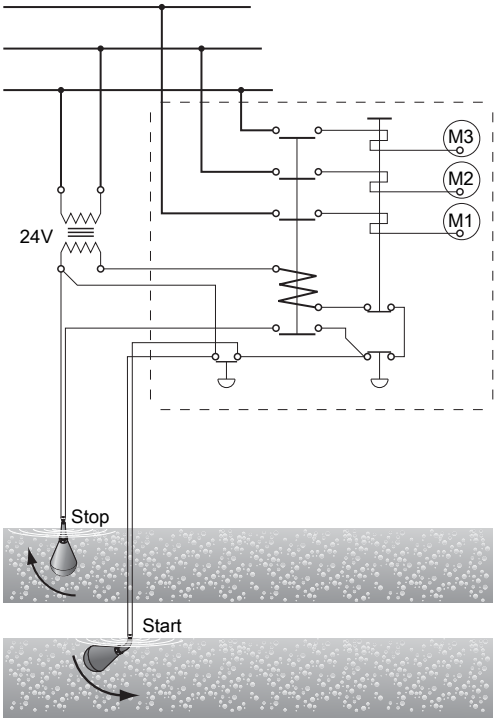
To conform to local regulations, the level regulators are normally connected through a transformer to a low-tension control circuit.

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

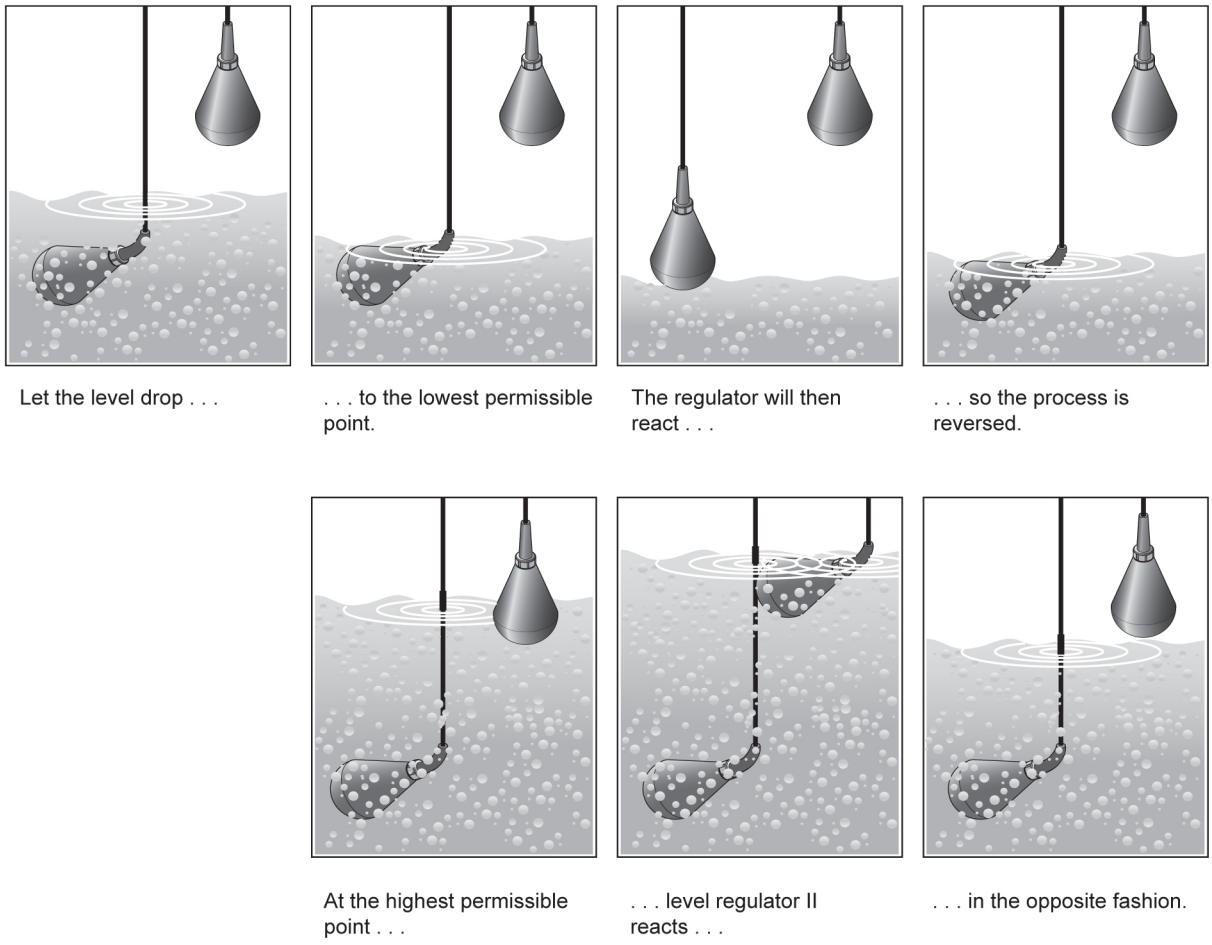


Figure 4

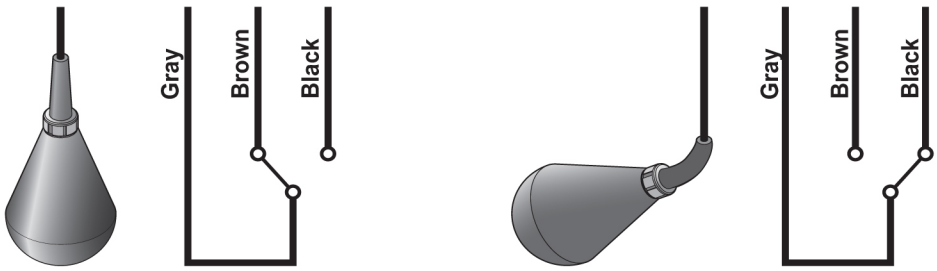


Figure 5: Colour code

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

Table 2

Version	For density (g/cm^3)	Color of level switch	Length of cable (m)	Type of cable	Approvals	For market	Notes
582 88 00	0.65 - 0.80	Blue	20	1	CE		
582 88 01	0.80 - 0.95	Blue	20	1	CE		
582 88 02	0.95 - 1.10	Blue	6	1	CE		
582 88 03	0.95 - 1.10	Blue	13	1	CE		
582 88 04	0.95 - 1.10	Blue	20	1	CE		
582 88 05	1.05 - 1.20	Blue	20	1	CE		
582 88 06	1.20 - 1.30	Blue	20	1	CE		
582 88 07	1.30 - 1.40	Blue	20	1	CE		
582 88 08	1.40 - 1.50	Blue	20	1	CE		
582 88 09	0.65 - 0.80	Grey	20	5	CSA/CE	Canada	
582 88 10	0.80 - 0.95	Grey	20	5	CSA/CE	Canada	
582 88 11	0.95 - 1.10	Grey	6	5	CSA/CE	Canada	
582 88 12	0.95 - 1.10	Grey	13	5	CSA/CE	Canada	
582 88 13	0.95 - 1.10	Grey	20	5	CSA/CE	Canada	
582 88 14	1.05 - 1.20	Grey	20	5	CSA/CE	Canada	
582 88 15	1.20 - 1.30	Grey	20	5	CSA/CE	Canada	
582 88 16	1.30 - 1.40	Grey	20	5	CSA/CE	Canada	
582 88 17	1.40 - 1.50	Grey	20	5	CSA/CE	Canada	
582 88 18	0.65 - 0.80	Grey	20	1	CSA/CE	Canada	
582 88 19	0.80 - 0.95	Grey	20	1	CSA/CE	Canada	
582 88 20	0.95 - 1.10	Grey	6	1	CSA/CE	Canada	
582 88 21	0.95 - 1.10	Grey	13	1	CSA/CE	Canada	
582 88 22	0.95 - 1.10	Grey	20	1	CSA/CE	Canada	
582 88 23	1.05 - 1.20	Grey	20	1	CSA/CE	Canada	
582 88 24	1.20 - 1.30	Grey	20	1	CSA/CE	Canada	
582 88 25	1.30 - 1.40	Grey	20	1	CSA/CE	Canada	
582 88 26	1.40 - 1.50	Grey	20	1	CSA/CE	Canada	
582 88 27	0.65 - 0.80	Blue	20	2	CE	USA	
582 88 28	0.80 - 0.95	Blue	20	2	CE	USA	
582 88 29	0.95 - 1.10	Blue	6	2	CE	USA	
582 88 30	0.95 - 1.10	Blue	13	2	CE	USA	
582 88 31	0.95 - 1.10	Blue	20	2	CE	USA	
582 88 32	1.05 - 1.20	Blue	20	2	CE	USA	
582 88 33	1.20 - 1.30	Blue	20	2	CE	USA	

Version	For density (g/cm^3)	Color of level switch	Length of cable (m)	Type of cable	Approvals	For market	Notes
582 88 34	1.30 - 1.40	Blue	20	2	CE	USA	
582 88 35	1.40 - 1.50	Blue	20	2	CE	USA	
582 88 36	0.95 - 1.10	Grey	30	5	CSA/CE	Canada	
582 88 37	0.95 - 1.10	Grey	50	5	CSA/CE	Canada	
582 88 38	0.95 - 1.10	Grey	100	5	CSA/CE	Canada	
582 88 39	0.95 - 1.10	Grey	150	5	CSA/CE	Canada	
582 88 51	0.95 - 1.10	Red	65	3	CE		
582 88 52	0.95 - 1.10	Red	6	3	CE		
582 88 53	0.95 - 1.10	Red	13	3	CE		
582 88 54	0.95 - 1.10	Red	20	3	CE		
582 88 55	0.95 - 1.10	Red	6	3	CSA/CE	Canada	
582 88 56	0.95 - 1.10	Red	13	3	CSA/CE	Canada	
582 88 57	0.95 - 1.10	Red	20	3	CSA/CE	Canada	
582 88 58	0.95 - 1.10	Red	6	4	CE	USA	
582 88 59	0.95 - 1.10	Red	13	4	CE	USA	
582 88 60	0.95 - 1.10	Red	20	4	CE	USA	
582 88 70	0.65 - 0.80	Blue	20	5	CE		
582 88 71	0.80 - 0.95	Blue	20	5	CE		
582 88 72	0.95 - 1.10	Blue	6	5	CE		
582 88 73	0.95 - 1.10	Blue	13	5	CE		
582 88 74	0.95 - 1.10	Blue	20	5	CE		
582 88 75	1.05 - 1.20	Blue	20	5	CE		
582 88 76	1.20 - 1.30	Blue	20	5	CE		
582 88 77	1.30 - 1.40	Blue	20	5	CE		
582 88 78	1.40 - 1.50	Blue	20	5	CE		
582 88 79	0.95 - 1.10	Blue	65	1	CE		
582 88 80	0.95 - 1.10	Blue	30	1	CE		
582 88 81	0.95 - 1.10	Blue	50	1	CE		
582 88 82	0.95 - 1.10	Grey	30	1	CSA/CE	Canada	
582 88 83	0.95 - 1.10	Grey	50	1	CSA/CE	Canada	
582 88 84	0.95 - 1.10	Blue	30	2	CE	USA	
582 88 85	0.95 - 1.10	Blue	50	2	CE	USA	
582 88 86	0.95 - 1.10	Red	30	3	CE		
582 88 87	0.95 - 1.10	Red	50	3	CE		
582 88 90	0.95 - 1.10	Blue	30	5	CE		
582 88 91	0.95 - 1.10	Blue	50	5	CE		
582 88 92	0.95 - 1.10	Red	6	3	CE	Japan	
582 88 93	0.95 - 1.10	Red	13	3	CE	Japan	
582 88 94	0.95 - 1.10	Red	20	3	CE	Japan	

Version	For density (g/cm^3)	Color of level switch	Length of cable (m)	Type of cable	Approvals	For market	Notes
582 88 95	0.95 - 1.10	Blue	6	1	CE	Japan	
582 88 96	0.95 - 1.10	Blue	13	1	CE	Japan	
582 88 97	0.95 - 1.10	Blue	20	1	CE	Japan	
582 88 98	0.95 - 1.10	Blue	50	1	CE	Japan	
594 79 10	0.95 - 1.10	Blue	70	5	CE		
594 79 13	0.95 - 1.10	Blue	100	5	CE		
594 79 18	0.95 - 1.10	Blue	150	5	CE		
594 79 19	0.95 - 1.10	Blue	20	5	CE		*
594 79 20	0.95 - 1.10	Grey	20	5	CSA/CE		*
594 79 40	0.95 - 1.10	Black	6	5	ATEX/ IECEx		* Zener barrier 84 01 07 required
594 79 41	0.95 - 1.10	Black	13	5	ATEX/ IECEx		* Zener barrier 84 01 07 required
594 79 42	0.95 - 1.10	Black	20	5	ATEX/ IECEx		* Zener barrier 84 01 07 required
594 79 21	0.95 - 1.10	Transparent	6	5	CE		

Type of cables:

1. Blue PVC jacket with color coding of conductors: grey- brown - black
2. Blue PVC jacket with color coding of conductors: red - white - black
3. Red PVC jacket with color coding of conductors: grey- brown - black
4. Red PVC jacket with color coding of conductors: red - white - black
5. Black NBR/PVC jacket with color coding of conductors: grey- brown - black

Comments:

* Designed for low current, slow movements and oil - Includes micro switch with gold plated contacts.

Xylem |ˈzīləm|

1) The tissue in plants that brings water upward from the roots
2) A leading global water technology company

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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The original instruction is in English. All non-English instructions are translations of the original instruction.

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