



TF SERIES VIBRATING PROBES FOR LIQUIDS

# Installation and operating manual



Hycontrol Ltd, Larchwood House, Orchard Street,  
Redditch, Worcestershire, UK. B98 7DP  
Tel: +44 (0)1527 406800 Fax: +44 (0) 1527 406810  
Email: sales@hycontrol.com Web: www.hycontrol.com  
Company registered in England No: 1755684

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## 1. PRODUCT OVERVIEW

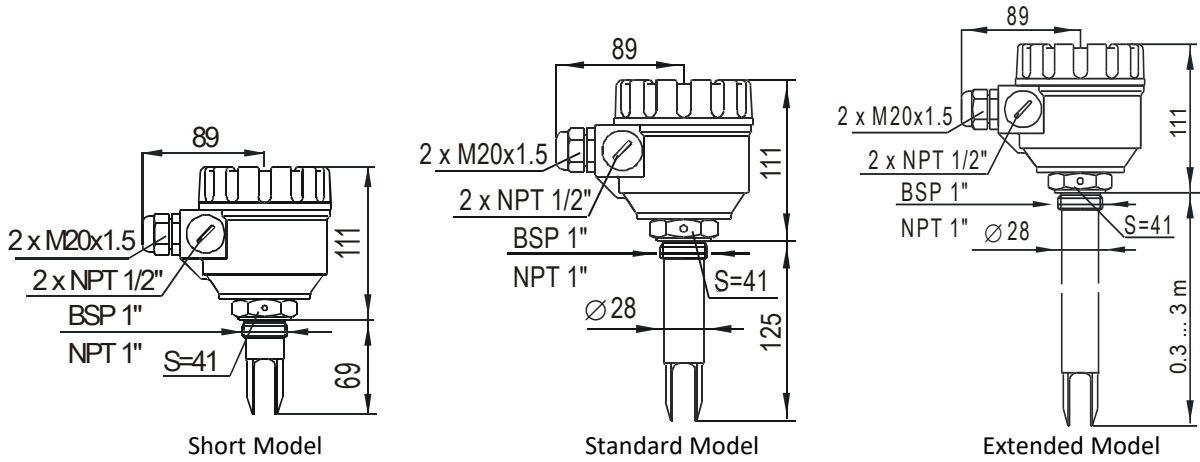
Hycontrol's TF Series Vibrating Probes are ruggedly-designed switch sensors that are used for detection of liquid levels throughout the process industries, and can be customised for many applications, including corrosive, hazardous or hygienic environments. By using the probes as high or low fail-safe switch overfilling of tanks and dry run of pumps can be prevented.

## 2. TECHNICAL DATA

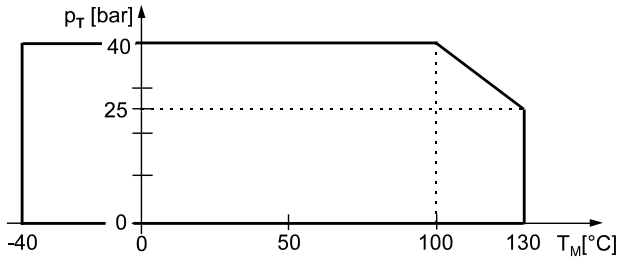
SPECIFICATION		TF SERIES
Wetted parts		St.st. 1.4571 (X 6 CrNiMoTi 17122) or ECTFE/PFA coated stainless steel
Process connection		According to the order code
Housing material		Aluminium: Powder paint coated
Temperature ranges	Medium	-40 °C to +130 °C PP flange: -20 °C to +90 °C ECTFE coated st.st. flange: -40 °C to +120 °C - for Derating see diagrams
	Ambient	-30 °C to +70 °C
Maximum pressure		40 bar (with PP flange 6 bar) - see Derating diagrams
Probe length		69 to 3000 mm
Minimum medium density		≥ 0.7 kg/dm <sup>3</sup>
Maximum medium viscosity		≤ 10000 mm <sup>2</sup> /s (cSt)
Response time	Getting immersed	≤ 0.5 sec
	Getting free	≤ 1 sec - see Response Time diagram
Operation mode indicator		Bi-colour LED
Operation mode selection		Switch for selection of HIGH or LOW fail-safe mode
Output		1 or 2 SPDT relays Relay 1: 250V AC, 8A, AC 1      Relay 2: 250V AC, 6A, AC 1
Electric connections		M20 x 1.5 cable gland; ∅ 6 to 12 mm cables (0.75 to 2.5 mm <sup>2</sup> wire cross section)
Supply voltage		20 ... 255V AC and 20-60V DC
Consumption		AC: 1.2-17 VA; DC: < 3W
Electrical protection		Class I.
Ingress protection		IP 67 (NEMA 6)
Weight		1.3 kg + 1.2 kg/m

**WARNING!** Temperature difference between inner and outer surface of the ECTFE coated flanges must not exceed 60°C. If necessary, insulate outer surface of the flange.

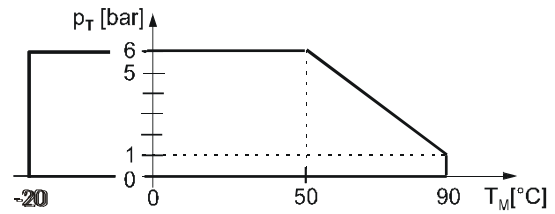
### 3. DIMENSIONS



### 4. DERATING DIAGRAMS

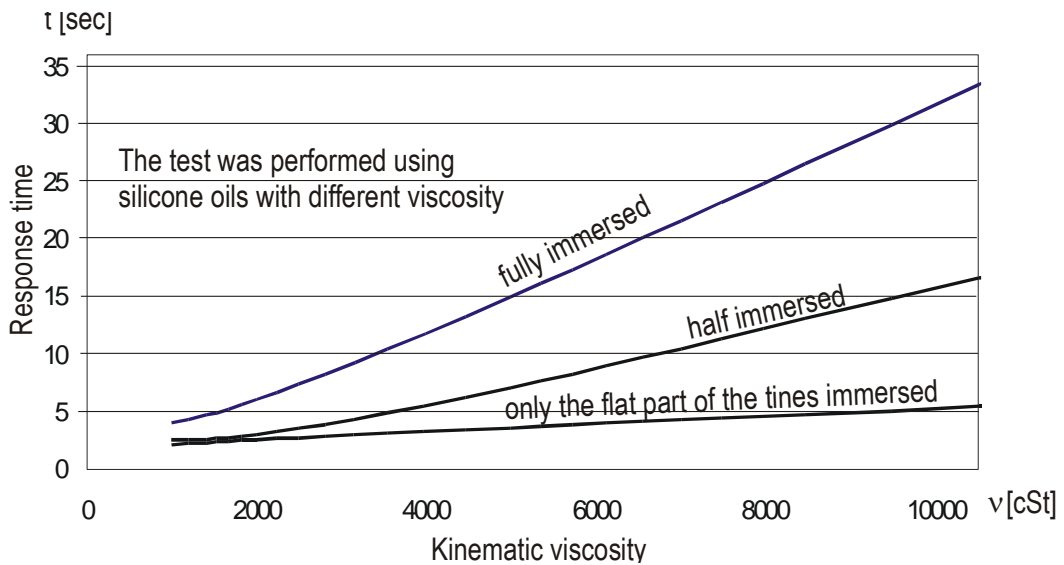


For all models (except PP flanged)



For models with Polypropylene flange

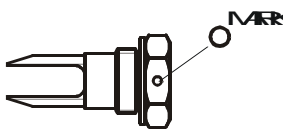
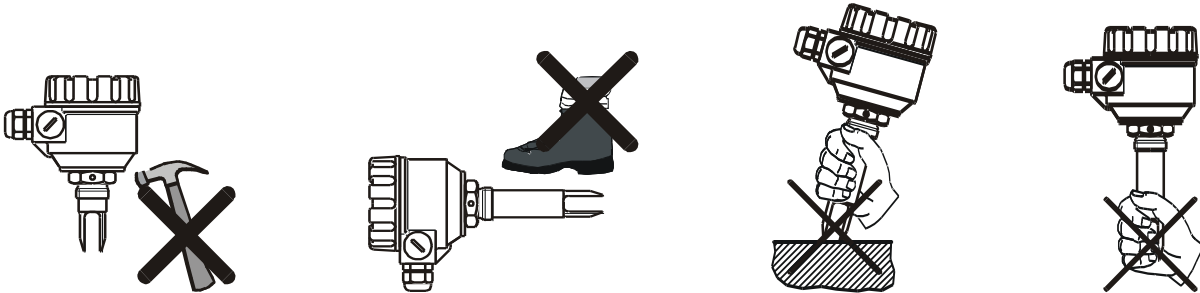
### 5. RESPONSE TIME – MEDIUM VISCOSITY



Response time (when getting free) versus medium viscosity

## 6. INSTALLATION

Take care to avoid damaging the unit when handling.

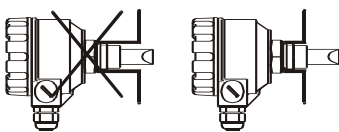
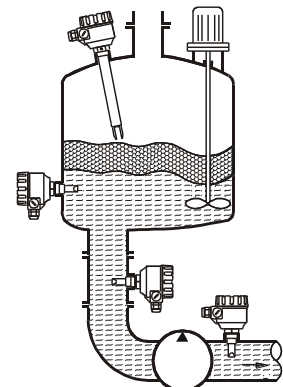


For positioning the fork-tines, use the marking on the hexagonal neck as reference. Use a TEFLON (PTFE) tape to aid the positioning of the fork-tine. If the fork-tine position is irrelevant then use the sealing ring provided.

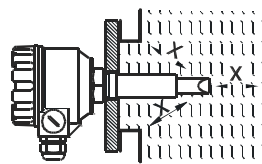
**DO NOT** twist the housing to screw the unit into the process connection. Instead do it by means of the SW=41mm hexagonal neck. After screwing the device tightly into place, the housing can be rotated by hand (max. 300°) to adjust the cable outlets to the required position.

The TF Series probes can be mounted in many possible positions, as illustrated to the right.

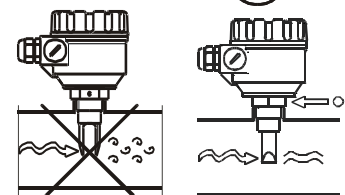
In applications featuring liquids with low viscosity (without risk of material remaining on the forks) any of the mountings shown to the right are possible. In high viscosity applications (due to risk of material remaining on the forks) we recommend only vertical (top) mounting. In applications with side mounting vertical positioning of the forks is recommended.



Mounting threaded versions

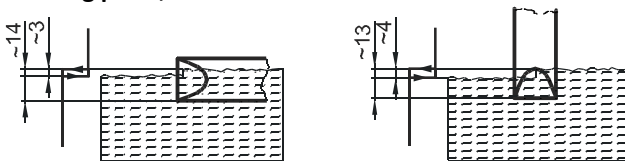


Critical distances  
(x min = 5mm)



Mounting in pipe forks must be parallel to the direction of flow

### Switching point, switch differential:



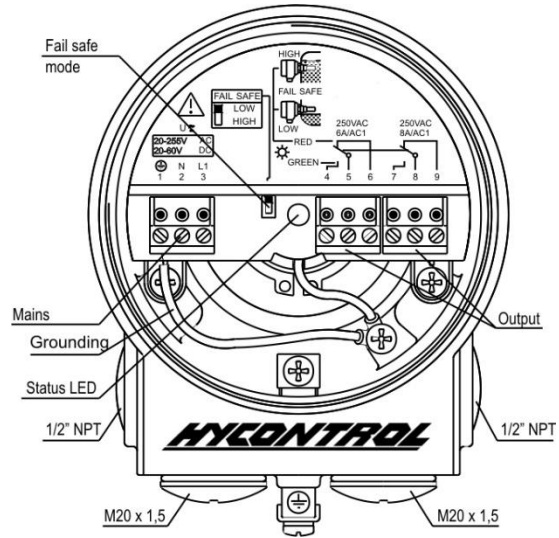
(Values are for water at 25°C)

Please note the switching point as well as the switch differential depends slightly on both liquid density and mounting position.

### 7. ELECTRICAL CONNECTIONS

Unscrew the housing cover to reveal the device’s controls and connections, as illustrated on the right. use 6-12mm outer diameter cables and tighten cable glands as well as housing cover after installation to ensure an IP67 sealing.

Use outside or inside grounding screw terminal for grounding the unit.



### 8. ADJUSTMENT

Power supply	Fork	Switch pos.	Operation mode		Output
			Fail safe	Status LED	
Yes	Immersed	High	HIGH	RED	De-energised
		Low	LOW	GREEN	Energised
	Free	High	HIGH	GREEN	Energised
		Low	LOW	RED	De-energised
No	Free or immersed	HIGH or LOW	NOT LIT	De-energised	

### 9. MAINTENANCE & STORAGE

The HYCONTROL TF Series switches do not require maintenance on a regular basis. In some instances, however, the vibrating section may need to be cleaned from the deposited material. This must be carried out carefully.

Store in an ambient temperature of between -25 to +60°C. Relative humidity: max. 98%.