



Level



Pressure



Flow



Temperature



Liquid Analysis



Registration



Systems Components



Services



Solutions

Level limit switch for bulk solids Minicap FTC260

E-direct

www.e-direct.us



FTC260



- Calibration-free startup
- Active buildup compensation
- Maintenance free design
- Mechanically rugged
- No moving parts to wear
- Minimum/Maximum failsafe switch selection
- Sensitivity adjustment
- FM dust-ignition-proof approval

Measurement principle

The Minicap is an electronic switch. When the limit is exceeded or the load falls below the limit, a switching signal is output. A switch housing or signal output device (e.g. lights, horns, programmable logic controller, DCS, etc.) can be connected to the Minicap. It has a switch for minimum/maximum failsafe selection. It detects the formation of deposits on the probe, and compensates for the effects of this so that the switching point is always accurately maintained. The effect of deposit compensation depends on the thickness of the coating on the probe, the conductivity of coating, and the sensitivity adjustment of the electronics. The Minicap comes factory calibrated. Sensitivity adjustments can be made in the field. To ensure safe operation, the Minicap system must be properly grounded in a metal or reinforced concrete vessel. For vessels made of non-conducting material, the ground wire must be connected to an earth ground near the vessel. Commercially available installation cable can be used for the connections.

Product: Bulk solids	Probe length: Rod: 5.51"
Process pressure: -14.5 to +362 psi	Product dielectric constant: $\epsilon_r \geq 1.6$
Product temperature: -40 to +248 °F	Grain size: Diameter ≥ 1.2 "

Application

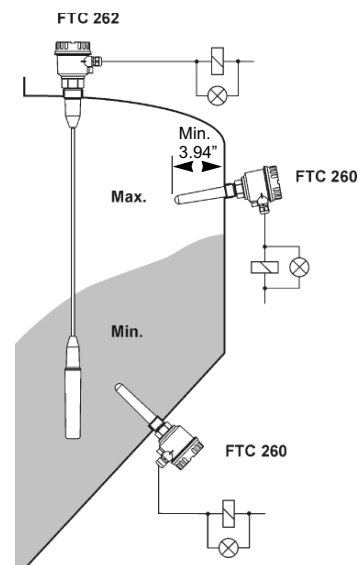
The Minicap FTC260 is suitable for level detection of powdery and fine-grain bulk solids, such as grain, flour, powdered milk, mixed feed, cement, chalk or gypsum. Also in dust explosive areas. The Minicap comes in two versions:

- Relay output (SPDT – single-pole double-throw) with AC or DC power or
- PNP output with three-wire DC connection

Application example

Level detection in vessels with bulk solids. The vessels can be made of various materials (e.g. metal, plastic, concrete), as these do not affect measurement.

The filling stream should not be directed onto the probe.



Minicap FTC260

Technical data

Output

- Output signal **DC-PNP:** I_{max} 200 mA, overload and short circuit protection, residual voltage at I_{max} [maximum current] $U_{max} < 2.9$ V
AC/DC-SPDT:
AC: $I_{max} = 4$ A, $I_{min} = 1$ mA, $U_{min} = 6$ V, $U_{max} = 253$ V, $P_{max} = 1000$ VA
DC: max. 4 A / 30 V, max. 0.2 A/253 V
- Malfunction signal **DC-PNP:** < 100 μ A
AC/DC-SPDT: relay released
- Switching delay 0.5 s upon covering/uncovering sensor

Power supply

- Supply voltage **DC-PNP:** 10.8 to 45 V DC, transient pulse up to 55 V DC, current input 30 mA (max.), reverse polarity protection
AC/DC-SPDT (relay contact): 20 to 253 V AC or 20 – 55 V DC, max. current input: 130 mA (max)
- Electrical connection screw terminals, stranded 18 AWG wire ½" NPT conduit entry

Accuracy

- Drift horizontal ± 0.12 " (3 mm), vertical ± 0.23 " (6 mm)
- Hysteresis horizontal 0.15" (4 mm), vertical 0.27" (7 mm)
- Switchpoint horizontal at center of probe -0.19 " (5 mm), vertical 1.57" (40 mm)

Operating conditions

- Ambient temperature -40 to $+158$ °F (to 140 °F DIP)
- Climate class as per standard DIN-IEC 60, part 2-38
- Protection system NEMA 4 polyester housing
- EMC compatibility as per NAMUR standard at 10 V/m
- Material temperature -40 to $+248$ °F (to 176 °F DIP)
- Pressure -14.5 to 362 psi

General

- Medium bulk goods with grain size up to 1.2" (30 mm), relative dielectric constant $\epsilon_r \geq 1.6$ (relative dielectric constant attained as a rule where weight of load is 15.6 lbs/ft³ (250 g/l))
- Flexural strength 314 lbs. (at tip of probe)
- Process connection 1" NPT, ANSI B 1.20.1
- Adaptor inner thread 1" NPT
outer thread 1¼" NPT

Approvals

- Certificate (option) FM dust-ignition-proof (DIP) CL. II, III;
Div. 1; Gr. E-G
- FDA sensor material is FDA compliant

Applications

Gray background:

Application limits of Minicap exceeded.

Recommendation:

Soliphant FTM 260 to be used.

In general:

If the dielectric constant of the solid is not known, then the density (apparent weight) of the solid is a deciding factor. Under normal conditions the Minicap functions in food with a density of 15.6 lbs/ft³ (250 g/l) and above or in plastic or mineral materials with a density of 37.4 lbs/ft³ (600 g/l) and above.

Grain, seed, legumes and their products

Examples	ρ in lbs/ft ³ (approx)	ϵ_r (approx)	Function
Rice	48.0	3.0	yes
Cornstarch (packed)	42.4	2.6	yes
Flour (wheat)	36.2	2.4	yes
Corn grit	31.2	2.1	yes
Sunflower seeds	23.7	1.9	yes
Noodles	23.1	1.9	yes
Bran (wheat)	15.6	2.3	yes
Popcorn	1.9	1.1	no

Minerals, inorganic materials

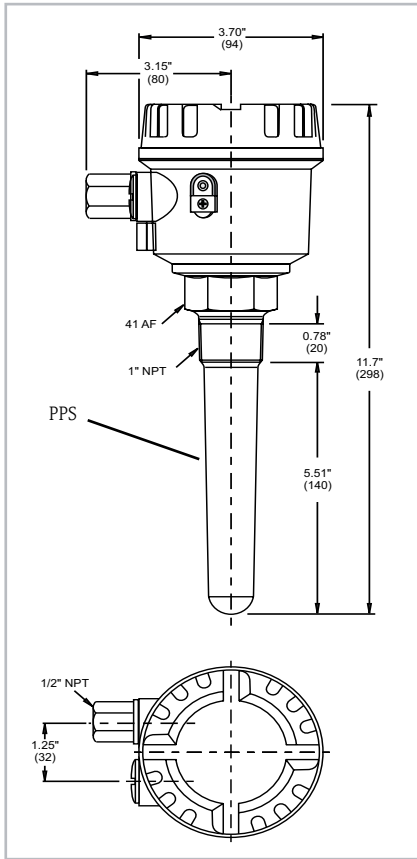
Cement	65.5	2.2	yes
Plaster	45.6	1.8	yes
Chalk (packed)	33.7	1.6	(yes)
Chalk (loose)	22.5	1.4	no

Plastics

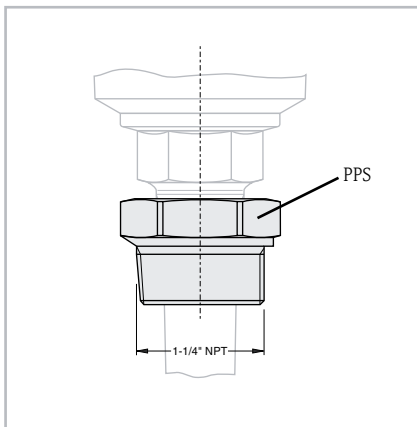
ABS granulate	39.3	1.7	yes
PA granulate	38.7	1.7	yes
PE granulate	35.0	1.5	no
PVC powder	34.3	1.4	no
PU dust	5.0	1.1	no

Minicap FTC260

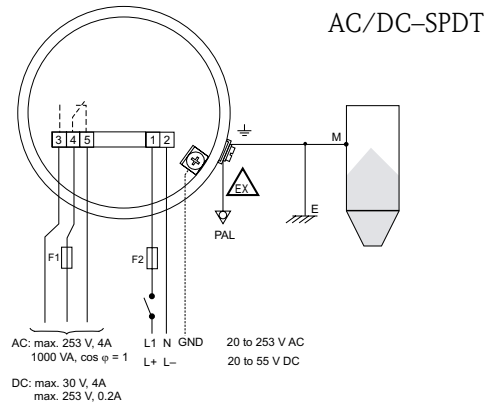
Dimensions in inches (mm) and materials



Adaptor

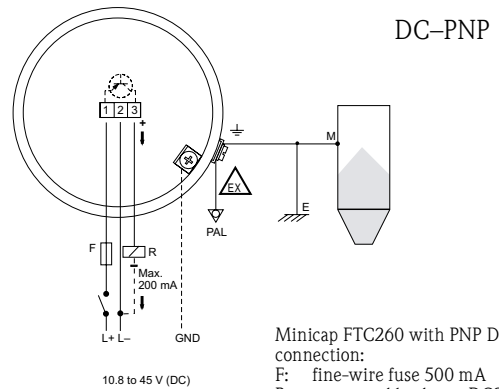


Electrical connection



Minicap FTC260 with AC or DC connection and relay output (SPDT):

- F1: fine-wire fuse for protection of relay contact depending on the connected load
- F2: Fine-wire fuse, 500 mA
- M: ground connection to vessel or to metal parts of vessel
- E: earth ground



Minicap FTC260 with PNP DC connection:

- F: fine-wire fuse 500 mA
- R: connected load, e.g. DCS, programmable logic controller, relay
- M: ground connection to vessel or to metal parts of vessel
- E: earth ground

- The Minicap system is protected against reverse polarity.
- If the connections are reversed, then the green light goes out.

Minicap FTC260

Many other models, versions and options are available. Please contact Endress+Hauser for more information.

Product	Version	Order no.	Price/piece in \$			we hereby order:	total price:
			1 to 5	6 to 15	16 to 35		
FTC260/ SPDT	Standard	FTC260-AB4B1	\$270.00	\$243.00	\$219.00	pcs	\$
	with FM DIP approval	FTC260-JB4B1	\$311.00	\$280.00	\$252.00	pcs	\$
FTC262/ PNP	236 inch rope, standard	FTC262-AB62B1	Consult factory			pcs	\$
	236 inch rope, with FM DIP approval	FTC262-JB62B1	Consult factory			pcs	\$
FTC262/ SPDT	236 inch rope, standard	FTC262-AB64B1	Consult factory			pcs	\$
	236 inch rope, with FM DIP approval	FTC262-JB64B1	Consult factory			pcs	\$
Accessories	for FTC260 and FTC262						
	Transparent PC cover (not for dust-ignition-proof)	943201-1001	\$8.00			pcs	\$
	Rope shortening kit	52005918	\$23.00			pcs	\$
	for FTC260						
	Steel adaptor for 1 1/4" NPT	943215-0042	\$12.00			pcs	\$
316Ti SS adaptor for 1 1/4" NPT	943215-0043	\$52.00			pcs	\$	

Net excluding cost of shipping and taxes.

Acceptance per our Standard Terms and Conditions (find at www.e-direct.us).

Total price:

FOB Greenwood, IN; shipped pre-paid; shipping charges and applicable taxes added to invoice.

\$ _____

E-direct catalog (free)

Shipping method

Ground

Priority One Day

Priority Two Day



E-direct
Endress+Hauser, Inc.
2350 Endress Place
Greenwood, IN 46143

(For customers in the USA only)

Online Shop www.e-direct.us

Order: by phone **888-EH DIRECT**
(343-4732)

by fax **800-321-7754**

For special requests, e-mail us: e-direct@us.endress.com

Warranty

Should an instrument fail during the 1 year warranty period, a replacement unit will be provided.

Delivery

Shipment from receipt of order for quantities 1-3 within 2 business days.



People for Process Automation