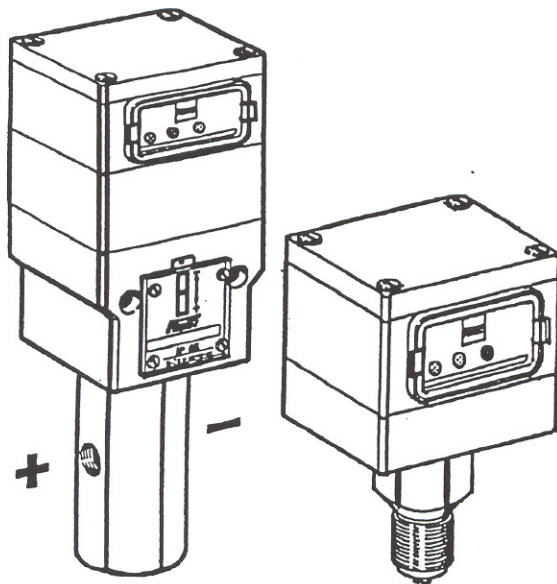


Fitting and Operating Instruction



High Pressure Sensors

General

A qualified installer has to carry out and to supervise mounting and first operation of the appliance

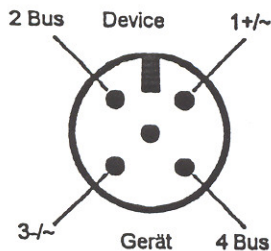
Description

The FEMA LON series is provided with default configuration settings from the factory (figure 3). Using standard Echelon configuration tool or LNS based tools, the sensor can be configured with job-specific settings. The power and bus connection is provided by a M12 plug (included in delivery).

Types:

SN1-355-L, SN3-355-L, SN6-355-L, SN10-355-L, SN25-355-L, FHBN1-355-L, FHBN3-355-L, FHBN5-355-L und FHBN10-355-L (SN025-355-L see low pressure sensor data sheet)

Connection diagramm



Safety Instruction !

Mounting

- Tighten only with the screwdriver applied to the hexagon of the pressure sensor.
- You never use housing as lever arm and do not turn the housing.

Electrical wiring and power

- The unit is supplied with 24VAC or 24 to 36VDC. With a DC power supply pay attention to correct polarity. The device can be destroyed if the connection is faulty.
Connect the appliance to the plug as shown in connection diagramm.
- You never apply a voltage higher 48 V to one of the terminals.

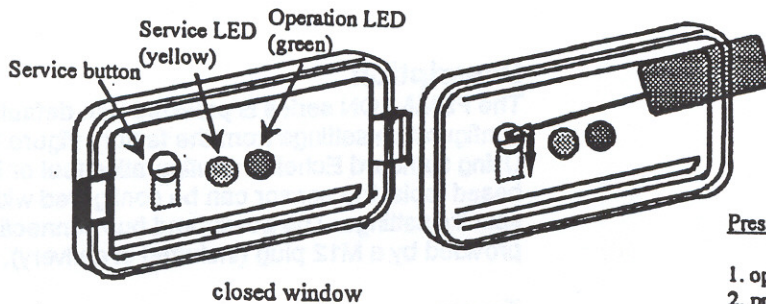
Operation LED (green)

LED task, error handling:	priority	set nvo_press invalid	set nvo_limit invalid	LED blink quantity (*) 1 = on 0 = off (16 steps)
LP_Status.VrefFail (1)	1	y	y	1010000000000000
LP_Status.LimitError (2)	2	n	y	1010100000000000
wink command active	3	n	n	1111111100000000
normal run	4	n	n	1111111111111111

(*) The duration of one step is: 150ms

- (1) Operation power too low
In this case the sensor element is measuring wrong pressure values.
All pressure values are set to invalid.
- (2) Low limit (nciLimitLow) is set higher than a high limit (nciLimitHigh).

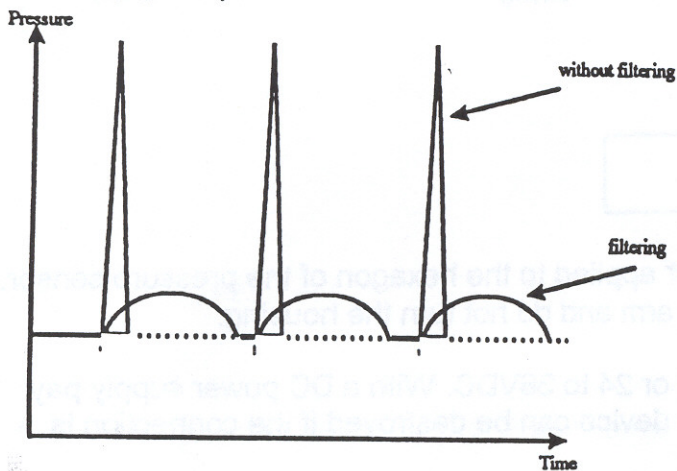
The function of service LED and service button see Echelon documentation



Press service button

1. open the window
2. press button cautiously down (until service LED goes on)
3. Neuron ID is sending
4. close the window

Filtering (figure 1)



Safety Instruction

Do not touch the plane with the screw driver.

Safety Instruction

The higher the filter value (nciFilter rating)
The lower is the resulting peak and the
reaction time

Limits and Hysteresis

The graph in Figure 1 shows the main application.

An input voltage signal measured with the onboard ADC is converted to a pressure Value in the range between $nciRangeMin$ and $nciRangeMax$. In this range four limit values can be activated:

(for low pressure application the names have a "P" added):

$nciLimitLow(P)1$, $nciLimitLow(P)2$, $nciLimitHigh(P)1$, $nciLimitHigh(P)2$.

When the LimitHigh values are reached (coming from low pressures) a relating alarm value (network output variable) is set:

$nciLimitHigh(P)1$ sets $nvoLimitHigh1$,

$nciLimitHigh(P)2$ sets $nvoLimitHigh2$.

When the LimitLow values are reached (coming from high pressures) a relating alarm value (network output variable) is set:

$nciLimitLow(P)1$ sets $nvoLimitLow1$,

$nciLimitLow(P)2$ sets $nvoLimitLow2$.

The alarm value for the LimitHighs is reset when the pressure value falls under the limit and its hysteresis:

$nciHystHigh(P)1$ belongs to $nciLimitHigh(P)1$,

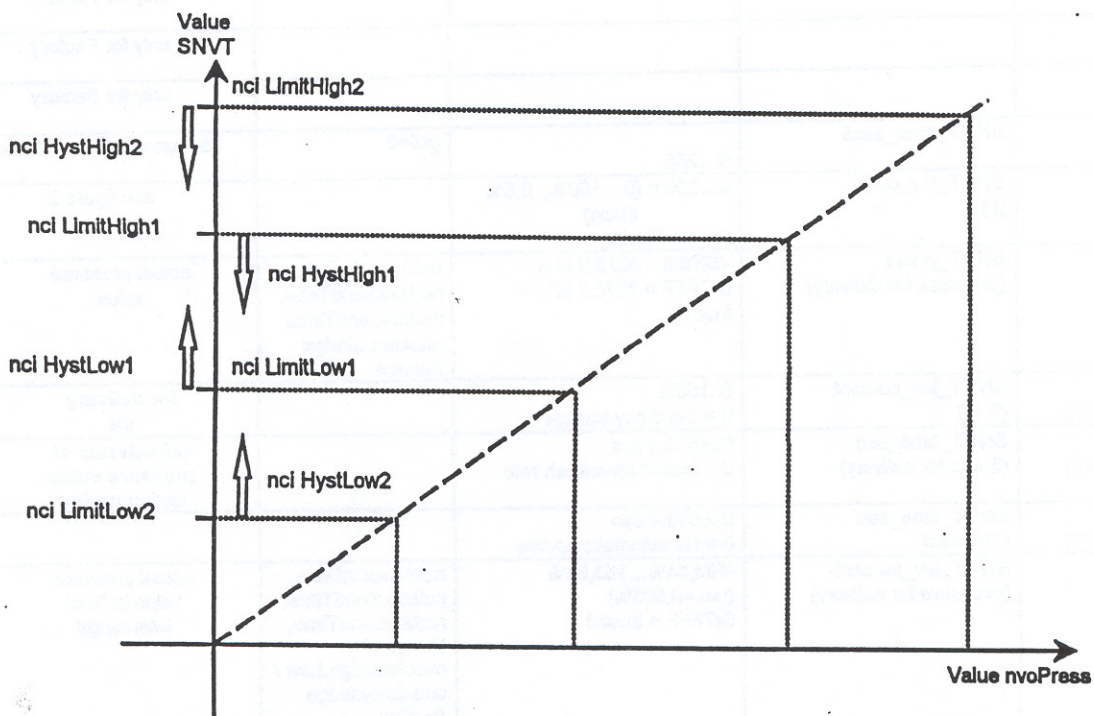
$nciHystHigh(P)2$ belongs to $nciLimitHigh(P)2$.

The alarm value for the LimitLows is reset when the pressure rises over the limit and its hysteresis:

$nciHystLow(P)1$ belongs to $nciLimitLow(P)1$,

$nciHystLow(P)2$ belongs to $nciLimitLow(P)2$.

Alarm values (Figure 2)



Description of the used SNVT/ SCPT (figure 3)

This table shows all used standard network variables.

High pressure application with *Pressure Sensor Profile1030*
(all following NVs are used for this applications)

Network Variable / Self documentation string	SNVT type {Default value}	Range	Network outputs: Send conditions / Service	Description
nvoLimitHigh1 {"@0#2;"}	SNVT_switch {OFF for delivery}	OFF = {0, false} ON = {200, true} Invalid = {x, 255}	Any Change / acknowledge Service	Alarming ON if nvoPress is higher than nciLimitHigh1 OFF if nvoPress is lower than nciLimit1 - nciHystHigh1
nvoLimitLow1 {"@0#4;"}	SNVT_switch {OFF for delivery}	OFF = {0, false} ON = {200, true} Invalid = {x, 255}	Any Change / acknowledge Service	Alarming ON if nvoPress is lower than nciLimitLow1 OFF if nvoPress is higher than nciLimitLow1 + nciHystLow1
nvoLimitHigh2 {"@0#3;"}	SNVT_switch {OFF for delivery}	OFF = {0, false} ON = {200, true} Invalid = {x, 255}	Any Change / Service	Alarming ON if nvoPress is higher than nciLimitHigh2 OFF if nvoPress is lower than nciLimitHigh2 - nciHystHigh2
nvoLimitLow2 {"@0#5;"}	SNVT_switch {OFF for delivery}	OFF = {0, false} ON = {200, true} Invalid = {x, 255}	Any Change / acknowledge Service	Alarming ON if nvoPress is lower than nciLimitLow2 OFF if nvoPress is higher than nciLimitLow2 + nciHystLow2
nviAMN {"@0#9;"}				only for Factory
nviAMX {"@0#10;"}				only for Factory
nvoRAW {"@0#8;"}				only for Factory
nroSWversion {"@0#11;"}	SNVT_char_ascil	0...255	polled	Software version number
nciFilterRating {"&1,0,0\x80,93;"}	SNVT_lev_cont {0}	0...200 = {0.. 100%, 0.5% steps} 0 = No filtering		see figure 2
nvoPress {"@0#1;"}	SNVT_press {pressure for delivery}	-3276.8 .. 3276.6 kPa 0x7FFF = 3276.7 kPa = Invalid	nciSendOnDelta, nciMaxSendTime, nciMinSendTime/ unacknowledge Service	actual pressure value
nciSendOnDelta {"&1,0,0\x80,27;"}	SNVT_lev_percent {5%}	0..100% 0 = Send any change		for delivery 5%
nciMinSendTime {"&1,0,0\x80,52;"}	SNVT_time_sec {5 sec for delivery}	0..6553.4 sec 0 = Maximum refresh rate		refresh rate of pressure value and alarming
nciMaxSendTime {"&1,0,0\x80,49;"}	SNVT_time_sec {300 sec}	0..6553.4 sec 0 = No automatic update		
nvoPressPercent {"@0#1;"}	SNVT_lev_percent {pressure for delivery}	-163,84%...163,83% (res.=0,005%) 0x7FFF = Invalid	nciSendOnDelta, nciMaxSendTime, nciMinSendTime, change of nvoLimitHigh,Low / unacknowledge Service	actual pressure value in % of total range
nciLimitLow1 {"&1,0,0\x80,18;"}	SNVT_press {nviRMN for delivery}	-3276.8 .. 3276.6 kPa 0x7FFF = 3276.7 kPa = No Limit Check		for delivery set to " minRange value 1
nciLimitHigh1 {"&1,0,0\x80,9;"}	SNVT_press {nviRMX for delivery}	-3276.8 .. 3276.6 kPa 0x7FFF = 3276.7 kPa = No Limit Check		for delivery set to " maxRange value 1

Network Variable / Self documentation string	SNVT type (Default value)	Range	Network outputs: Send conditions / Service	Description
nciLimitLow2 ("&1,0,0x80,19;")	SNVT_press (nviRMN for delivery)	-3276.8 .. 3276.6 kPa 0x7FFF = 3276.7 kPa = No Limit Check		for delivery set to * minRange value1
nciLimitHigh2 ("&1,0,0x80,10;")	SNVT_press (nviRMX for delivery)	-3276.8 .. 3276.6 kPa 0x7FFF = 3276.7 kPa = No Limit Check		for delivery set to * maxRange value 1
nciHystHigh1 ("&1,0,0x80,11;")	SNVT_press {0 Pa}	-3276.8 .. 3276.6 kPa 0 = No Hysteresis 0x7FFF = 3276.6 kPa = No Hysteresis		HystHigh1 delivery default =0
nciHystHigh2 ("&1,0,0x80,12;")	SNVT_press {0 Pa}	-3276.8 .. 3276.6 kPa 0 = No Hysteresis 0x7FFF = 3276.6 kPa = No Hysteresis		HystHigh2 delivery default =0
nciHystLow1 ("&1,0,0x80,13;")	SNVT_press {0 Pa}	-3276.8 .. 3276.6 kPa 0 = No Hysteresis 0x7FFF = 3276.6 kPa = No Hysteresis		HystLow1 delivery default =0
nciHystLow2 ("&1,0,0x80,14;")	SNVT_press {0 Pa}	-3276.8 .. 3276.6 kPa 0 = No Hysteresis 0x7FFF = 3276.6 kPa = No Hysteresis		HystLow2 delivery default =0
nviRMN ("@0#6;")				only for Factory
nviRMX ("@0#7;")				only for Factory

* minRange and maxRange values are the intended pressure values of the sensor

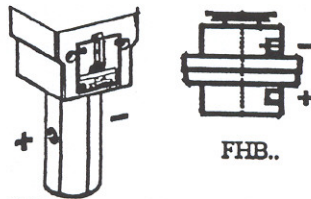
Technical Data and Installation

Cable entry Plug connection M12 four-pole (a four- or five-pole plug may be used) Operating voltage 24V AC ± 20% or 24V...36V DC	Transceiver and profile FTT 10A Profile 1030# Ambient temperature 0....+50°C	Protection class IP 65 Materials Housing: Makrolon Accessories included in delivery Plug M12 five-pole
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Type series SN...-355-L

Pressure port G ½ male Wrench size SW 27 Materials Sensor housing 1.4571 Pressure membrane 1.4435	Installation The series SN sensors are fitted directly to the pipeline or the pressure vessel.	Max. medium temp. -30....+100°C Measuring method piezoresistiv Linearity ≤ 1% FS
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Type series FHB...-355-L

Pressure port G ¼ female Wrench size 41 Sensor materials FHB...-355-L stainless steel 1.4571 / 1.4435 FHB...-355-L Perbunan and aluminium	Installation Direct on pressure line or wall mounting Max. medium temp.: +70°C Measuring method: mechanical-inductiv Linearity ≤ 2,5 % FS	+ high pressure -- low pressure  FHB..
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