

## Programmable double limit switch

Analogue input 0(4) - 20 mA

Selectable min- or max limits

Start-up and reaction timer

Supply voltage 24 VDC

Programmable inputs

Made in accordance with the **CE** and EMC regulations



FCD25 is a double limit switch for monitoring of current signals, f.inst. from 2-wire transmitters with 4-20 mA output or other units with current output.

### Analogue input

The analogue input is programmable for either 0-20 mA or 4-20 mA. The input range is adjustable too, down to 10 mA for 100% input range.

### Digital inputs

The digital inputs are programmable for either positive or negative logic. The inputs are programmed for either active low or active high.

At positive logic, input signals from 5-30 VDC are accepted.

At negative input, the input is connected to ground f.inst. with a contact or an NPN output from a sensor.

### Relay outputs

The unit is supplied with 2 relays, one for each limit.

Both relays have NO-contacts, and both of them are programmable for either activation or release, when the set limit is exceeded.

The alarms can be reset with the "Mode" button or input "S1".

### Setpoints

The unit have two independent setpoints, programmable as either min. or max. setpoint.

The setpoints are selected as a percentage of the range. It is possible to cancel the monitoring with the input S2.

### Start up timer

The start up timer is used if the start-up of a process is unstable and you do not want an alarm during start-up.

It is activated when the input signal exceeds approx. 5 % of the metering range.

If the start-up timer is set at 0, this function is cancelled.

### Reaction delay

For each setpoint you can program a reaction delay in order to avoid alarm in case of only a short exceeding of the setpoint.

### Hysteresis

The hysteresis can be used on both limits.

The hysteresis band is always above a min-limit and under a max-limit.

If the hysteresis function is used, an internal auto-reset function is used.

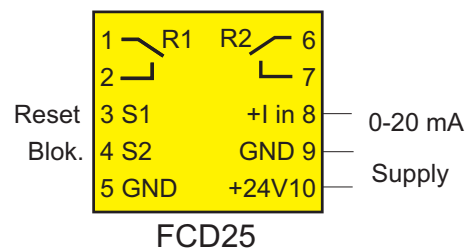
If you use the hysteresis at a min. setpoint, at the input signal goes to zero, you can reset the alarm by pressing the "Mode" button or activate input S1.

### Technical data:

<b>Supply voltage:</b>	24 VDC +/- 10%
<b>Current consumption:</b>	max. 60 mA
<b>Operating temp.:</b>	-15°C to +50°C
<b>Humidity:</b>	0 - 90% RH, non-condensing
<b>Max. load, relays:</b>	1-pole: 5 A - 250 VAC, ohmic load
<b>Analogue input:</b>	0(4) - 20 mA, 70 Ohm
<b>Digital inputs:</b>	pos. logic: 5-30 VDV neg. logic: 0 V
<b>Input S1:</b>	External reset
<b>Input S2:</b>	Alarm blocking
<b>Weight:</b>	200 g
<b>Dimensions:</b>	58 x 36 x 86 mm
<b>EMC og safety regulations.</b>	
<b>Emmision:</b>	EN 50 081 - 1
<b>Immunity:</b>	EN 50 082 - 2
<b>Safety:</b>	EN 60 730

**Approvals:** The units are produced in accordance with the CE og low voltage regulations.

### Connections:



FCD25

## Selection of parameters.

In the scheme you can see the 11 user programmable parameters. To get into the programming mode, press 'Mode' until the 'Setup'-LED is on and the display shows 'P00'.

Then you used the 'Up' and 'Down' for selection of the wanted parameter followed by 'Mode'.

Now the wanted parameter is selected, and you can change the value by pressing 'Up' and 'Down'.

The new value is stored by pressing 'Mode', and then you can select a new parameter.

To end the programming mode you select **Par. no. 00** and when you press 'Mode' you return to normal function.

**Par. no. 1.** Select input 0-20mA or 4-20mA.

**Par. no. 2.** Setpoint relay 1: Off, min. or max.

**Par. no. 3.** Setpoint relay 2: Off, min. or max.

**Par. no. 4.** If wanted the input range can have a reduced scale. You can program 100% input signal between 10 and 20mA.

**Par. no. 5.** Hysteresis for limit 1, see figure below to see the placement of the hysteresis band. Please note that an internal auto-reset function is activated when you use the hysteresis.

**Par. no. 6.** Hysteresis for limit 2.

**Par. no. 7.** Polarity for relay 1: Inverted / not inverted

**Par. no. 8.** Polarity for relay 2: Inverted / not inverted

**Par. no. 9.** Auto-Shut-Down is aktived (On), if the unit itself should block for min.-alarms, if the input goes to 0.

As an alternative, the input S2 can be used to block an alarm.

**Par. nr. 10.** De digitale indgange kan konfigureres til at være aktive høje (Hi) eller aktive lave (Lo).

**Par. nr. 11.** Programming lock, in order to avoid unwanted programming.

If activated, all parameters can be seen, but not changed

## Parameter list

Nr	Parameter	Description	Range	Def.
01	Input	Analogue input	0-20mA, 4-20mA	0.20
02	Limit 1	setpoint type	Off, min (Lo), max (Hi)	Hi
03	Limit 2	setpoint type	Off, min (Lo), max (Hi)	Lo
04	Zoom	Scaling of input signal	10..20mA	20
05	Hysteresis 1	Hysteresis for limit 1	Off, 1..50	Off
06	Hysteresis 2	Hysteresis for limit 2	Off, 1..50	Off
07	Polarity 1	Polarity relay 1	Inverted / not inverted	n.in
08	Polarity 2	Polarity relay 2	Inverted / not inverted	n.in
08	Auto-Shut-Down	Blocks at stop	Off, On	Off
10	Logic	Logic digital inputs	Negative (Lo), Positive (Hi)	Lo
11	Lock	Lock parameters	Off, On	Off

In addition the the parameters above, the FCD25 has also got a number of direct accible parameters. For access, use 'Mode' until the LED for the wanted parameter is on, and then you use the 'Up' and 'Down' to modify the parameter, see the next scheme.

Parameter	Description	Range	Def
Ts [s]	Start-up timer	0,0 .. 999s	2.0
Limit 1	Setpoint relay 1	5.. 99%	80
Limit 2	Setpoint relay 2	5.. 99%	20
Tr [s] (Limit 1)	Reaction delay limit 1	0,00 .. 655s	0,10
Tr [s] (Limit 2)	Reaction delay limit 2	0,00 .. 655s	1,00

## Peak-detectors

FCD25 is supplied with a max.- and a min.-peak detektor.

You can see the value by pressin 'Up' for max.-peak and 'Down' for min.-peak under 'Input [%]'.  
The peak detektors are reset after the time Ts, or by pressing 'Up'+ 'Mode' simultaneously for max.-peak and 'Down'+ 'Mode' for min.-peak.

**Function:**  
On the drawing below you can see a curve, which could be the start for anAC-motor (f.inst a pump) . In this example the curve indicates the power consumption.

## Example

In the example, the FCD25 is set to a max limit on limit 1 and a min limit on limit 2.

## Example

The start-up power peak should be filtered out, and to do this, the programmable start up timer (Ts) is used;

When the input signal exceeds 5%, Ts is activated. As long as Ts is active, the monitoring function is cancelled.

**Reaction timer and Hysteresis**  
You can see how the reaction timers (Tr Max and Tr Min) are activated, after the limit is exceeded. Tr is used to avoid alarms in case of only a short-time exceeding of the limit.

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