ITOH DENKI

TECHNOLOGY FOR TOMORROW

CIRCUIT BOARD
CB030

TECHNICAL DOCUMENTATION

POWER MOLLER®

SUMMARY

1 - Presentation of the Power Moller® product range

POWER MOLLER®

ELECTRONIC

- Standard circuit board
  - CB018
  - CB016 | CB016B
  - CB030
  - CBM-105
- ZPA circuit board
  - HB510 | HB510B
  - HBK-608
  - LCX-901
- Module circuit board
  - HBR-605

MOTORIZED ROLLERS

- AC Induction
  - Ø50
    - PM500 BS (K) 150 kg
    - PM500 BU (KU) 150 kg
    - PM500 BS-B (KB) 150 kg
- DC Brushless
  - External circuit board
    - Ø32
      - PM320 HS (32HS) 50 kg — CB018
    - Ø50
      - PM500 FE (50E) 300 kg — CBM-105 HB510
      - PM500 FE-B (50EB) 300 kg — CB016B HB510B
    - Ø60,5
      - PM605 FE (60E) 500 kg — CBM-105 HB510
      - PM605 FE-B (60EB) 500 kg — CB016B HB510B
      - PM605 KT 1000 kg — CB030 HBK-608
  - Integrated circuit board
    - Ø50
      - PM500 ME 50 kg — LCX-901
      - PM500 XE 300 kg — LCX-901
    - Ø60,5
      - PM605 XE (60XE) 500 kg — LCX-901

MODULE

- 90° transfer
  - F-RAT-S — HBR605 | CBM-105 | CBR-305
- 45° transfer
  - POP-UP — CBM-105 | CBR-305

[ ] Corresponding circuit board

kg Max load to be conveyed

(60E) Former part number

Mechanical brake version

2. Presentation of the circuit board

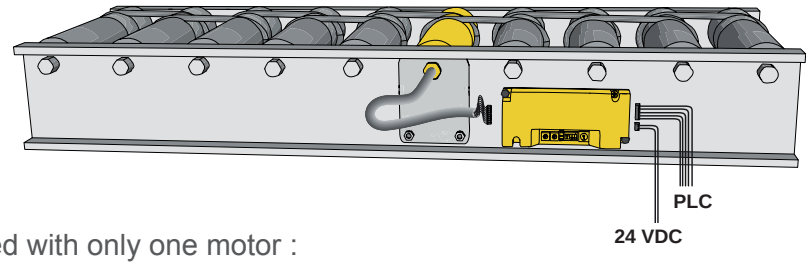
General characteristics

- Fastener hardware
  - 2 cross-head screws M4 x 15
  - 2 spring washers M4
  - 2 nuts M4
- 1 connectorWAGO 734-102 (2 points)

- 1 connectorWAGO 733-105 (5 points)

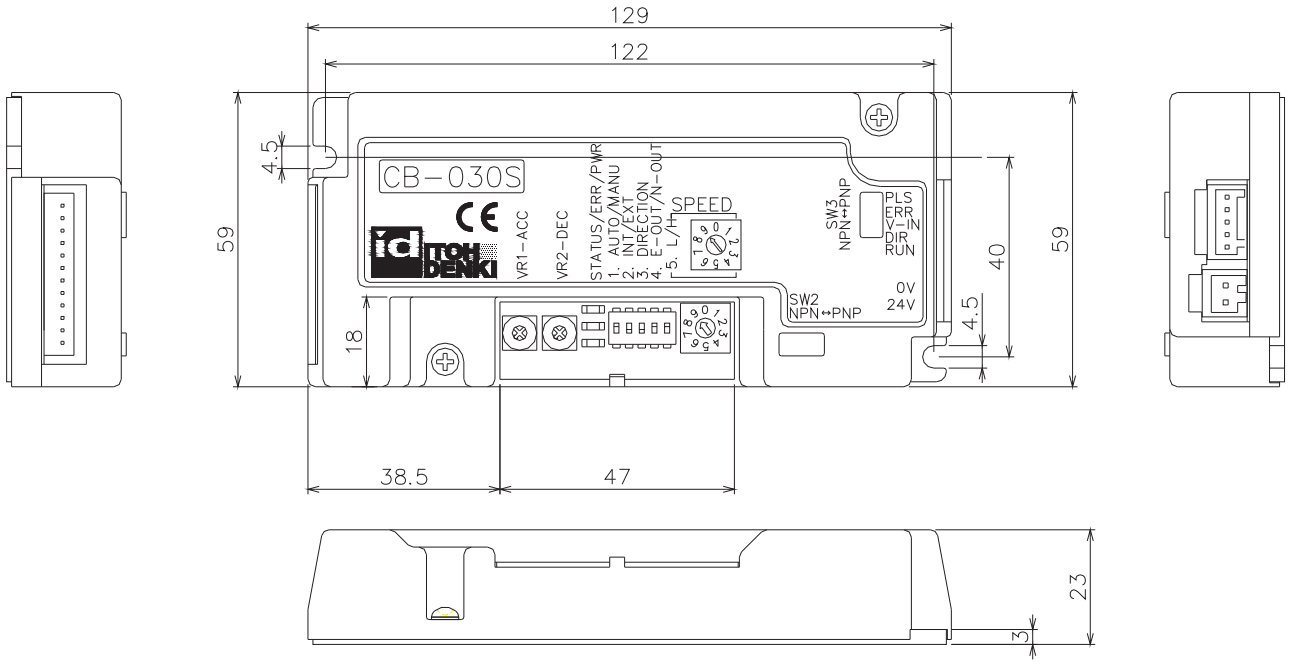
⇨ PNP Version : CB030-P
⇨ NPN Version : CB030-N

Motorized roller series compatible :
Série PM605KT



The circuit board CB030 must be associated with only one motor :
1 Power Moller ® 24 brushless = 1 CB030

Dimensions



SPECIFICATIONS

SPECIFICATIONS	Power supply	TBTS 24VDC ± 10% - ripple< 10%	
	Input current without motorized roller	0.03A	
	Start current limitation	7 A	
	Motor start time after start signal (RUN / STOP)	< 15 ms	
	Protection index	IP20	
	Protection	Integrated fuse of 10A Against polarity reversal 24V and 0V Thermal protection (95°C for circuit board and 105°C for the motor) Against induced overvoltage	
	Initialisation time Circuit board 24 V power supply	1s	
	Environment	From 0 to 40 °C Less than 90% relative humidity (avoid thermal shock) Neither corrosive nor explosive atmosphere Vibrations < 0,5 G	
FUNCTIONS	Start / Stop	Motorized roller start and stop	
	Direction of rotation	Inversion of rotation direction by external command Selection of motorized roller rotation direction by DIP switch	
	Speed variation	Selection of a set speed using a rotary switch or by injecting a 0 to 10 V dc analogue voltage (20 speeds)	
	Braking	Motorized roller dynamic braking	
	Acceleration / Deceleration	Acceleration and deceleration adjustable from 0 to 2.5 s	
	Pulse signal	2 pulses per rotor rotation. Output signal in NPN only via terminal CN2-5	
	Error signal	Selection of NPN or PNP logic for the output signal against thermal error, motor jam, low voltage, induced voltage, etc.	
	Signalling	Power supply with green LED Error with orange LED	
	Logic voltage level	<3V to the low level >18V for the high level	
CONNECTORS		**Circuit board side**	**Wire side**
	Power (CN1)	Wago 734-162 (10A max)	Wago 734-102 (10A max) Conductor cross-section : 0,5 - 1,5 mm² AWG 20~14
	Control (CN2)	Wago 733-365 (4A max)	Wago 733-105 (4A max) Conductor cross-section : 0,08 - 0,5 mm² AWG 28~20
	Motor (CN3)	S12B-XH-A (JST)	XHP-12 (JST)

3. Technical datas according motorized roller

Characteristic with PM605KT motorized roller

PM605KT Speed code 55

S (m/min) +/- 3%		Speed selection			Tangential force (N)		Torque (Nm)		Current (A)		
No load	Nominal	Internal by :		By external voltage	Nominal	Start-up	Nominal	Start-up	No load	Nominal	Start-up
		SW1-5	SW4								
65,4	65,4	ON	9	9,6~9,9	48,3	234,9	1,5	7,1	0,8	3,8	7,0
59,9	59,9		8	9,1~9,4	49,9		1,5		0,7	3,7	
57,2	57,2		7	8,6~8,9	50,9		1,5		0,7	3,6	
54,3	54,3		6	8,1~8,4	52,3		1,6		0,6	3,4	
51,8	51,8		5	7,6~7,9	53,3		1,6		0,6	3,3	
49,0	49,0		4	7,1~7,4	55,2		1,7		0,6	3,2	
43,5	43,5		3	6,6~6,9	57,7		1,7		0,5	3,1	
40,9	40,9		2	6,1~6,4	59,8		1,8		0,5	3,0	
38,2	38,2		1	5,6~5,9	61,6		1,9		0,4	3,0	
35,5	35,5		0	5,1~5,4	64,3		1,9		0,4	2,9	
32,6	32,6	OFF	9	4,6~4,9	66,5		2,0		0,4	2,8	
30,0	30,0		8	4,1~4,4	67,9		2,1		0,3	2,7	
27,2	27,2		7	3,6~3,9	69,9		2,1		0,3	2,6	
24,4	24,4		6	3,1~3,4	72,4		2,2		0,3	2,6	
21,8	21,8		5	2,6~2,9	75,1		2,3		0,3	2,5	
19,0	19,0		4	2,1~2,4	77,2		2,3		0,2	2,4	
16,3	16,3		3	1,6~1,9	80,2		2,4		0,2	2,2	
13,7	13,7		2	1,1~1,4	82,0		2,5		0,2	2,1	
11,0	11,0		1	0,6~0,9	83,4		2,5		0,1	1,9	
8,2	8,2		0	0,1~0,4	85,4		2,6		0,1	1,7	

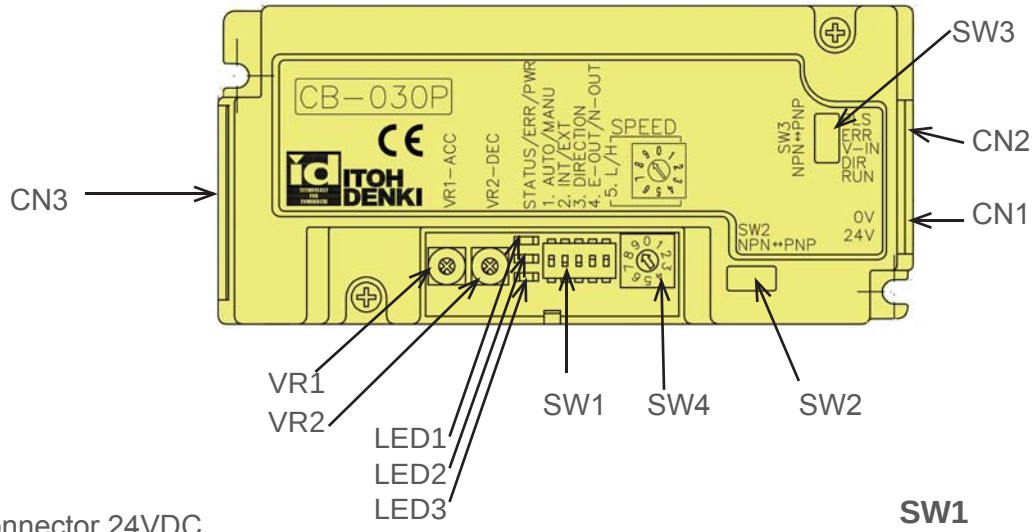
PM605KT Speed code 28

S (m/min) +/- 3%		Speed selection			Tangential force (N)		Torque (Nm)		Current (A)		
No load	Nominal	Internal by : SW1-5	Internal by : SW4	By external voltage	Nominal	Start-up	Nominal	Start-up	No load	Nominal	Start-up
34,9	34,9	ON	9	9.6~9.9	85,8	417,3	2,6	12,6	0,7	3,8	7,0
32,0	32,0		8	9.1~9.4	88,7		2,7		0,7	3,7	
30,6	30,6		7	8.6~8.9	90,4		2,7		0,6	3,6	
29,0	29,1		6	8.1~8.4	92,9		2,8		0,6	3,4	
27,7	27,6		5	7.6~7.9	94,7		2,9		0,5	3,3	
26,2	26,2		4	7.1~7.4	98,1		3,0		0,5	3,2	
23,3	23,3		3	6.6~6.9	102,5		3,1		0,5	3,1	
21,9	21,9		2	6.1~6.4	106,2		3,2		0,4	3,0	
20,4	20,4		1	5.6~5.9	109,3		3,3		0,4	3,0	
19,0	18,9		0	5.1~5.4	114,1		3,5		0,4	2,9	
17,5	17,5	OFF	9	4.6~4.9	118,2		3,6		0,3	2,8	
16,1	16,0		8	4.1~4.4	120,7		3,7		0,3	2,7	
14,5	14,6		7	3.6~3.9	124,2		3,8		0,3	2,6	
13,1	13,0		6	3.1~3.4	128,6		3,9		0,3	2,6	
11,6	11,6		5	2.6~2.9	133,4		4,0		0,2	2,5	
10,2	10,1		4	2.1~2.4	137,1		4,1		0,2	2,4	
8,7	8,7		3	1.6~1.9	142,5		4,3		0,2	2,2	
7,3	7,3		2	1.1~1.4	145,6		4,4		0,1	2,1	
5,9	5,8		1	0.6~0.9	148,2		4,5		0,1	1,9	
4,4	4,4		0	0.1~0.4	151,7		4,6		0,1	1,7	

PM605KT Speed code 15

S (m/min) +/- 3%		Speed selection			Tangential force (N)		Torque (Nm)		Current (A)		
No load	Nominal	Internal by : SW1-5	Internal by : SW4	By external voltage	Nominal	Start-up	Nominal	Start-up	No load	Nominal	Start-up
17,2	17,2	ON	9	9,6~9,9	174,3	848	5,3	25,7	0,7	3,8	7,0
15,8	15,8		8	9,1~9,4	180,2		5,5		0,7	3,7	
15,1	15,1		7	8,6~8,9	183,8		5,6		0,6	3,6	
14,3	14,3		6	8,1~8,4	188,7		5,7		0,6	3,4	
13,6	13,6		5	7,6~7,9	192,4		5,8		0,5	3,3	
12,9	12,9		4	7,1~7,4	199,3		6,0		0,5	3,2	
11,5	11,5		3	6,6~6,9	208,3		6,3		0,5	3,1	
10,8	10,8		2	6,1~6,4	215,9		6,5		0,4	3,0	
10,1	10,1		1	5,6~5,9	222,2		6,7		0,4	3,0	
9,3	9,3		0	5,1~5,4	232,0		7,0		0,4	2,9	
8,6	8,6	OFF	9	4,6~4,9	240,2		7,3		0,3	2,8	
7,9	7,9		8	4,1~4,4	245,3		7,4		0,3	2,7	
7,2	7,2		7	3,6~3,9	252,4		7,6		0,3	2,6	
6,4	6,4		6	3,1~3,4	261,3		7,9		0,3	2,6	
5,7	5,7		5	2,6~2,9	271,2		8,2		0,2	2,5	
5,0	5,0		4	2,1~2,4	278,7		8,4		0,2	2,4	
4,3	4,3		3	1,6~1,9	289,6		8,8		0,2	2,2	
3,6	3,6		2	1,1~1,4	295,9		9,0		0,1	2,1	
2,9	2,9		1	0,6~0,9	301,2		9,1		0,1	1,9	
2,2	2,2		0	0,1~0,4	308,4		9,3		0,1	1,7	

4. Location of items



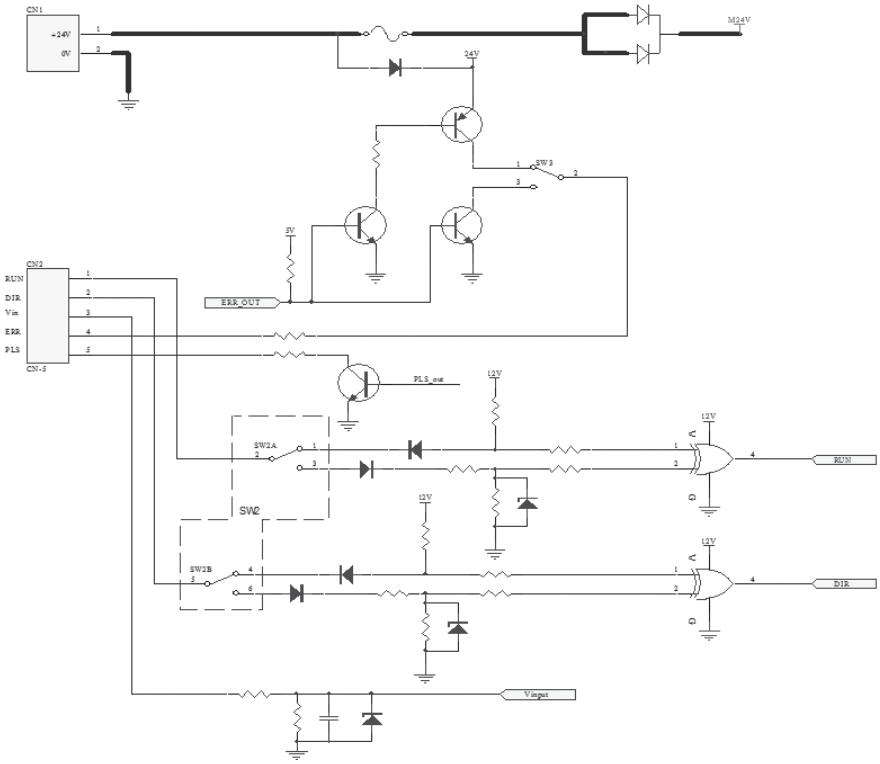
CN1	Supply connector 24VDC
CN2	Connector input / output control
CN3	Connector motor
LED1	Green LED supply
LED2	Red LED error
LED3	Orange LED
VR1	Potentiometer for acceleration
VR2	Potentiometer for deceleration
SW1	Dip-switches for configuration
SW2	Selection NPN/PNP input signal
SW3	Selection NPN/PNP output signal
SW4	Rotary switch for selecting a fixed speed

SW1

1	Selection restart mode
2	Selection internal / external speed
3	Selection direction of rotation (CW/CCW)
4	Selection error signal mode
5	Selection speed range

5. Wiring

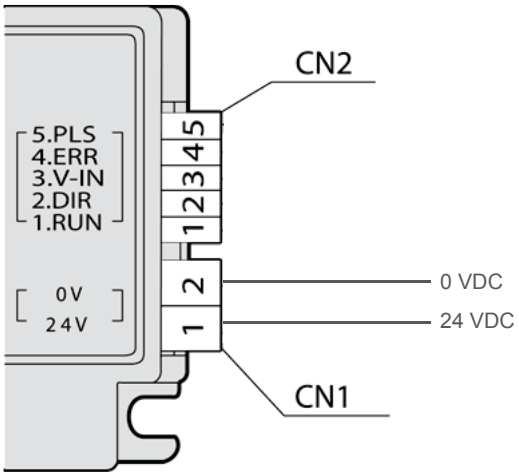
Internal circuit diagram



Output signal		
SW3	↑	PNP
	↓	NPN

Input signal		
SW2	→	PNP
	←	NPN

Connector CN1 - Power supply 24VDC

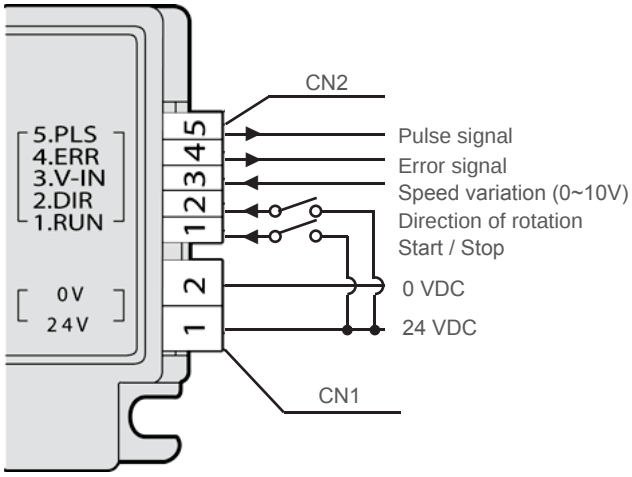


• 24 V dc switch-mode power supply, which can accept an overcurrent of 150% for 3 to 5 s, is recommended to optimize the supply power to the number of motorized rollers to be controlled
• The +24 V dc circuit is protected by a 10 A fuse.

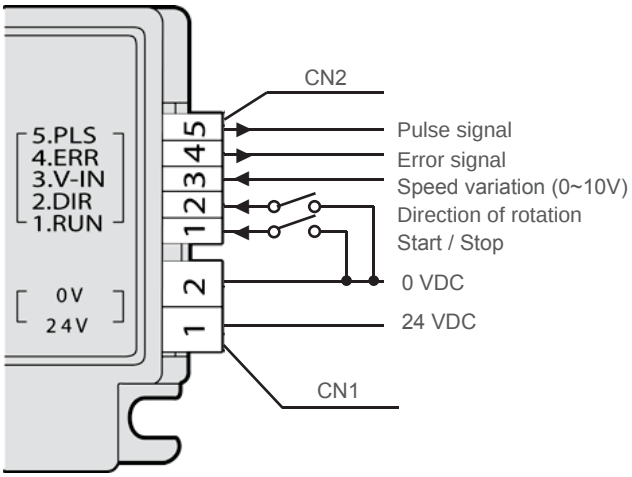
⚠ Provide a power supply that is sufficiently powerful in function of the type and number of motorized rollers to be powered.

Connector CN2 - Terminal 1 - Start / Stop (run)

➪ PNP version: CB030-P



➪ NPN version: CB030-N

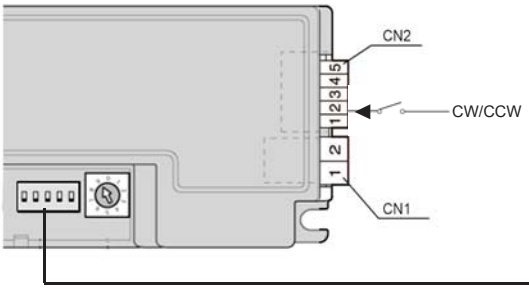


• START : contact closed
• STOP : contact open
• Input current : 7,3 mA
• Motorized roller start time ≤ 15 ms

⚠ When powering the circuit board, it is necessary to wait at least 1 s before giving the On command.

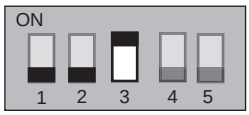
⚠ Do not use the 24 V dc circuit-breaker or the 24 V dc power-supply circuit-breaker to turn the motorized roller “On/Off”. You must use Terminal 1 of the CN2 connector.

Connector CN2 - Terminal 2 - Direction of rotation - CW/CCW (DIR)



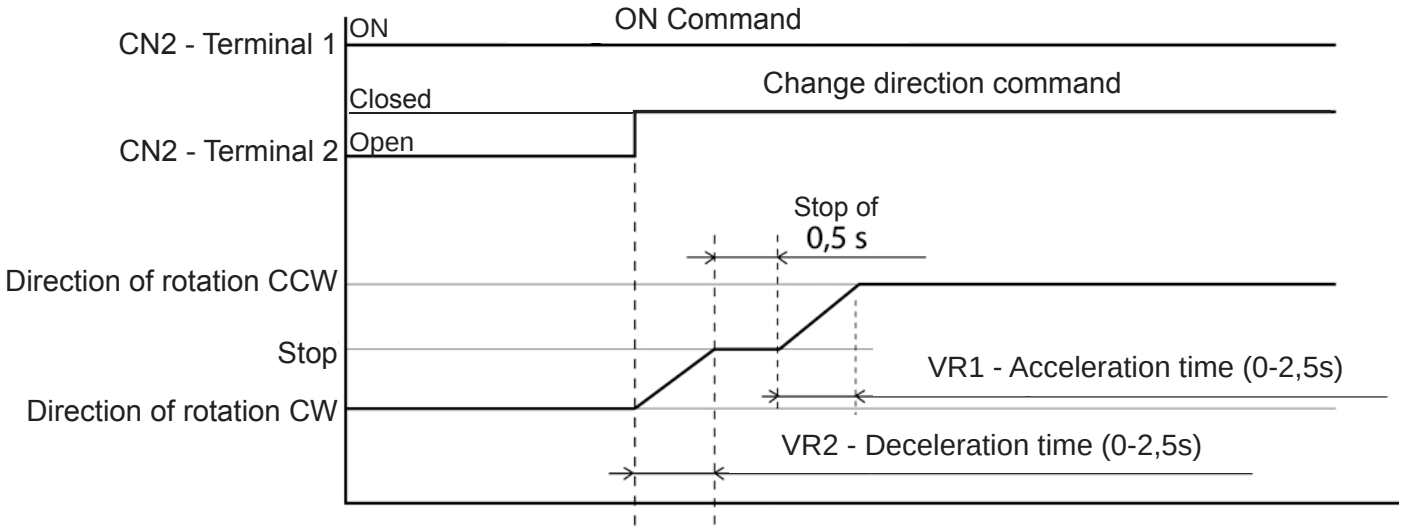
• The rotation direction is given in function of dip-switch 3 of SW1

• Input current 7,3 mA at 24 VDC

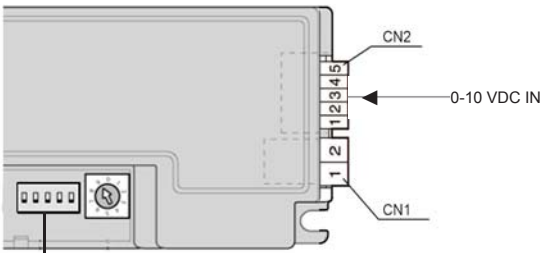


SW1

It is possible to invert the rotation direction during operation simply by opening or closing the contact on Terminal 2 of CN2.
In the event of a change in the rotation direction using the “acceleration/deceleration” function, the motorized roller will slow down then stop for 0.5s before starting to accelerate in the opposite direction of rotation.



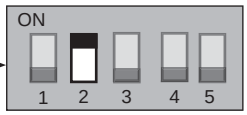
Connector CN2 - Terminal 3 - Speed variation (V-IN)



• Speed variation by external analogue voltage of between 0 and 10 V dc when Button 2 of SW1 is on “ON”.
• Input current 2 mA at 10VDC.

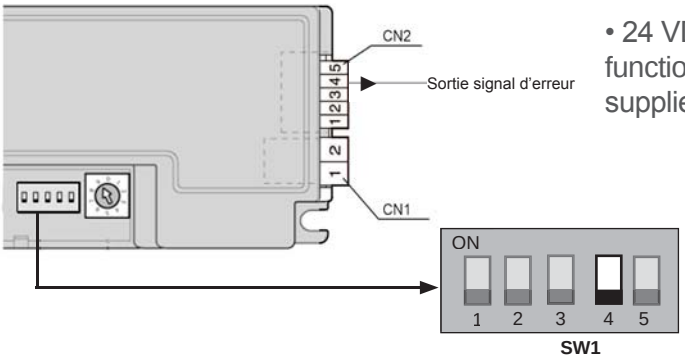
⚠ Connect all 0 VDC points of the external analogue power supply to the 0 VDC of the control panel power supply.

⚠ Do not exceed 10VDC



SW1

Connector CN2 - Terminal 4 - Error signal (ERR)

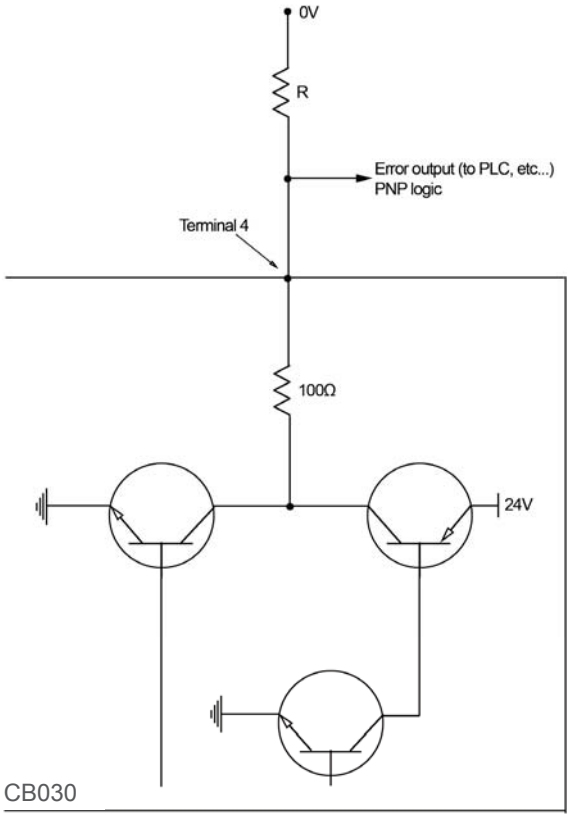


• 24 VDC error signal output – 25 mA max. to be adjusted in function of the programmable logic controller using a resistor (not supplied) to be added in addition to the integrated 100 Ω resistor.

ON
Sends a signal to Terminal 4 on CN2 when everything is normal.

OFF
Sends a signal to Terminal 4 on CN2 when there is a fault.

⚠ When powering off and on, the error signal is sent.
Do not consider this signal during 0.5s to power on, and 2s to power off.



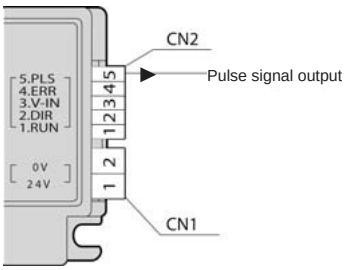
We must adjust the resistance «R» so that the current «i» does not exceed 25mA.

$$25mA \geq \frac{24}{R+100} \qquad R \geq \frac{24-2,5}{0,025}$$

$$R \geq 860\Omega$$

⚠ In the event of a current ≥25 mA, there is a risk of damaging the transistor.

Connector CN2 - Terminal 5 - Pulse signal (PLS)



• Pulse signal output: NPN by an open collector requiring the adjustment of the output voltage to 24 V dc max. and 25 mA max. using a resistor (not supplied) to be added in addition to the integrated 100 Ω resistor.

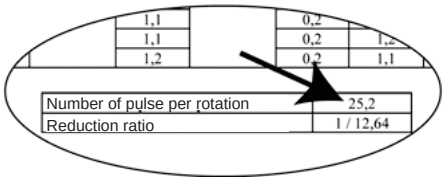
⚠ In the event of a current ≥25 mA, there is a risk of damaging the transistor.

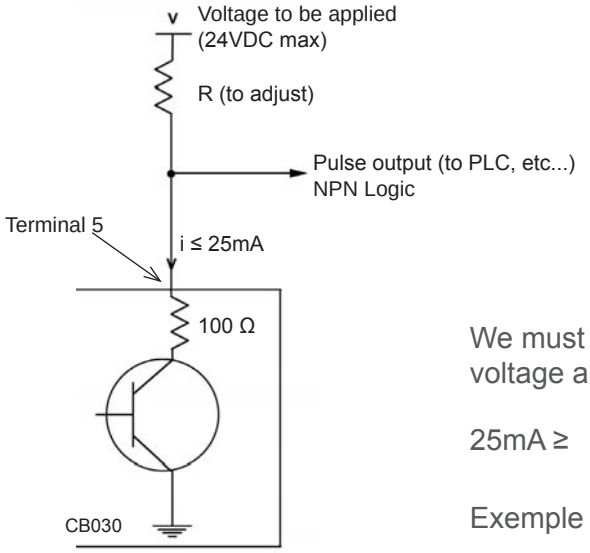
• 2 pulses per rotor turn.

• 5 µs time lag with the Hall effect sensor.

• The number of pulses per motorized roller turn is indicated in the technical data as a function of the series and its speed code.

Sélectors		Frequency	Number of rotor turns (rpm)	External via a voltage
SW1-1	SW2			
ON	9	155	4638	9,80+/-0,15
	8	152	4556	9,25+/-0,15
	7	145	4349	8,75+/-0,15
	6	138	4141	8,25+/-0,15
	5	131	3934	7,75+/-0,15
	4	124	3727	7,25+/-0,15
	3	110	3313	6,75+/-0,15
	2	104	3106	6,25+/-0,15
	1	97	2899	5,75+/-0,15
	0	90	2692	5,25+/-0,15
OFF	9	83	2485	4,75+/-0,15
	8	76	2278	4,25+/-0,15
	7	69	2071	3,75+/-0,15
	6	62	1864	3,25+/-0,15
	5	55	1657	2,75+/-0,15
	4	48	1450	2,25+/-0,15
	3	41	1242	1,75+/-0,15
	2	35	1035	1,25+/-0,15
	1	28	828	0,75+/-0,15
	0	21	621	0,25+/-0,15





We must adjust the resistance «R» according to the «V» voltage applied so that the current «i» does not exceed 25mA.

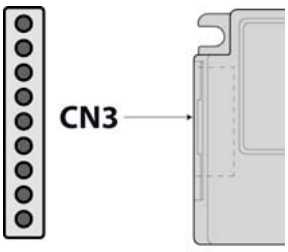
$$25mA \geq \frac{V}{R+100}$$

Exemple if V = 24VDC

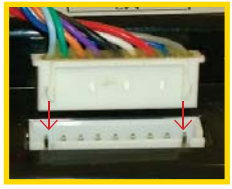
$$R \geq \frac{24-2,55}{0,025}$$

$$R \geq 860\Omega$$

Connector CN3 - Motor connector



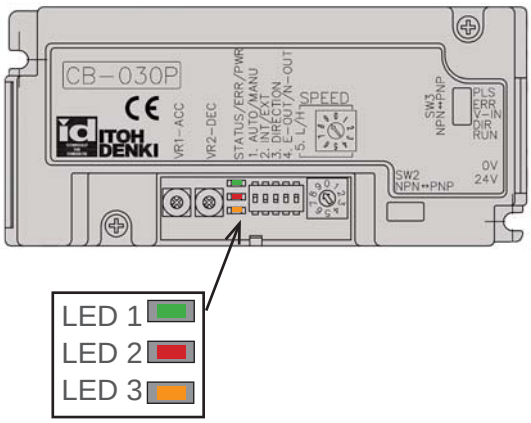
• Motorized roller connector type XHP-12 male 12 pin.



⚠ Respect the positioning of the connector when connecting.

⚠ Do not pull the cable to disconnect it.

6. LED 1, LED 2 AND LED3

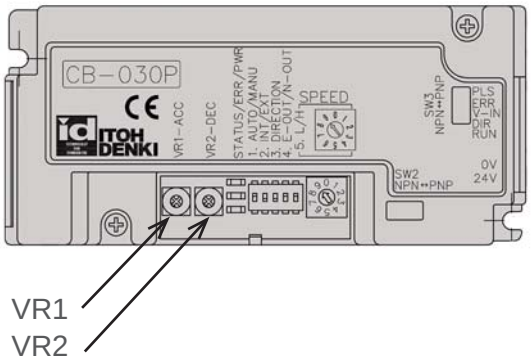


LED 1 (green)
The indicator is lit when the circuit board is powered.

LED 2 (red)
The indicator is lit when a malfunction has occurred and allows the type of fault to be identified (see page 20)

LED 3 (orange)
The indicator identifies the number of production errors.

7. Potentiometers VR1 and VR2

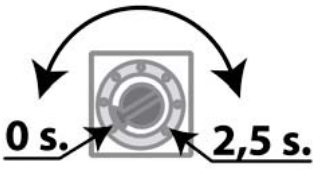


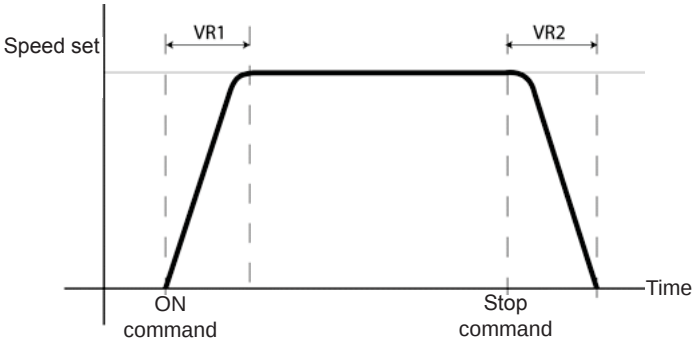
VR1 - Acceleration

VR2 - Deceleration

• The motorized roller acceleration and deceleration time can be adjusted between 0 and 2.5 s.

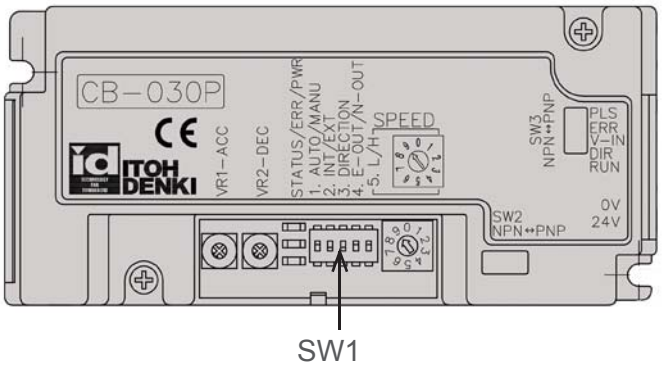
• The factory setting is 0 s (turned fully to the left)



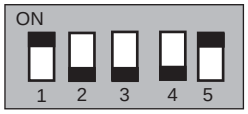


⚠ The set acceleration and deceleration time may be different from the actual motorized roller movement time.

8. Dip-switch for configuration SW1



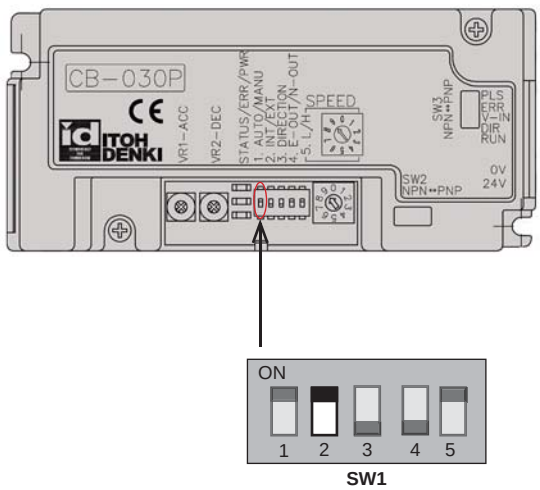
SW1 factory setting



SW1

Dip-switch	Function	ON	OFF
1	Restart mode	Manual	Automatic
2	Internal/external speed selection	Speed variation by external voltage (0 – 10 V).	Selection of a set speed with SW4. (Manual setting)
		See technical data as a function of the motorized roller.	
3	Selection of rotation direction CW / CCW	Change of CW or CCW rotation direction in function of the state of Terminal 2 of CN2 (see chapter on the rotation direction).	
4	Error signal selection mode	Signal sent to Terminal 4 of CN2 when everything is normal.	Signal sent to Terminal 4 of CN2 when there is a fault.
5	Selection of speed range	Selection of fixed speed : 20 speed available in combinaison with SW2 (see technical data depending on motorized roller).	
		Range of high speed	Range of low speed

SW1 - Dip-switch 1 : Selection of restart mode

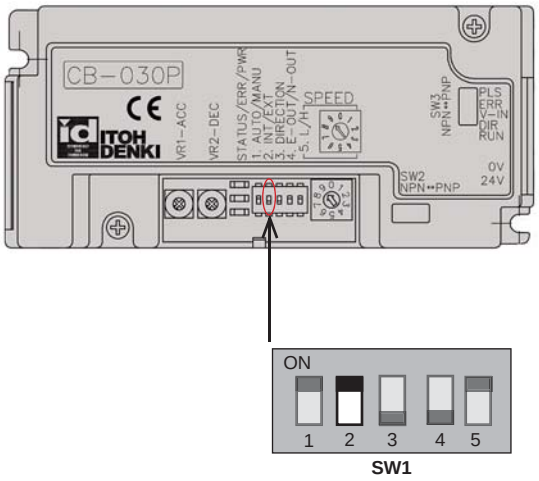


ON
Manual restart

OFF
Automatic restart

• Dip-switch 1 of SW1 allows to choose automatic restart or manual restart mode after a thermal fault.

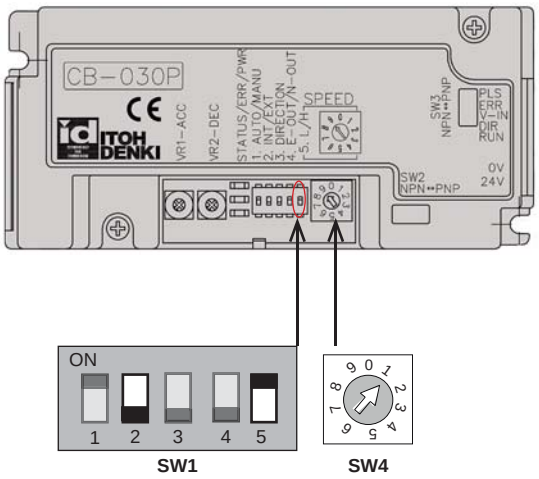
SW1 - Dip-switch 2 : Selection internal / external speed



	External by tension (V)
9	9,6~9,9
8	9,1~9,4
7	8,6~8,9
6	8,1~8,4
5	7,6~7,9
4	7,1~7,4
3	6,6~6,9
2	6,1~6,4
1	5,6~5,9
0	5,1~5,4
9	4,6~4,9
8	4,1~4,4
7	3,6~3,9
6	3,1~3,4
5	2,6~2,9
4	2,1~2,4
	1,6~1,9
	1,1~1,4
	0,6~0,9

Speed variation by external voltage
0 – 10 VDC

⚠ Must connect 0V of the circuit board with 0V of 0-10V supply for the speed variation.



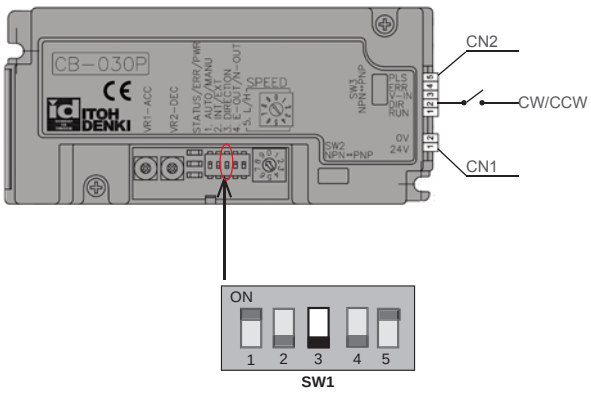
Selection of a set speed with Dip-switch 5 of SW1 and rotary switch SW4.

Nominal	Internal by : SW1-5	SW4	
65,4	ON	9	Range of high speed
59,9		8	
57,2		7	
54,3		6	
51,8		5	
49,0		4	
43,5		3	
40,9		2	
38,2		1	
35,5		0	
32,6	OFF	9	Range of low speed
30,0		8	
27,2		7	
24,4		6	
21,8		5	
19,0		4	
16,3		3	
13,7		2	
11,0		1	
8,2		0	

Exemple : PM605KT serie - Speed code 55

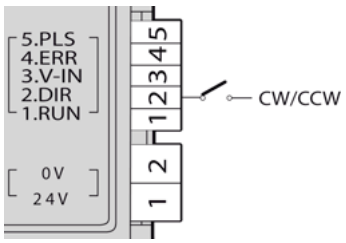
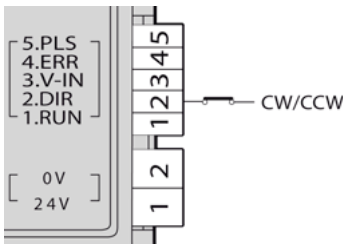
Dip-switch SW1		SW4	Speed
2	5		
OFF	ON		38,2
	OFF		30,0

SW1 - Dip-switch 3 : Selection of direction of rotation



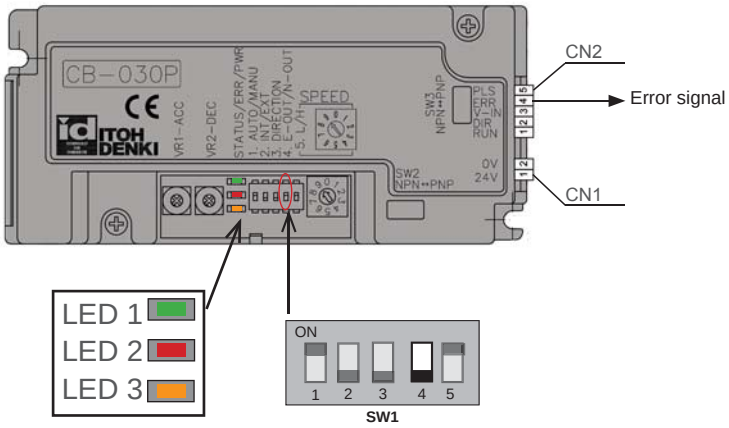
The rotation direction of a motorized roller is defined in function of the rotation direction selection associated with DIP switch 3 of SW1, with an open or closed contact on Terminal 2 of CN2 and the series of the motorized roller.

PM605KT serie

⚠ Do not invert rotation direction using dip-switch 3 during rotation.
To change rotation direction when using dip-switch 3, it is essential that the motorized roller be first stopped.

SW1 - Dip-switch 4 : Error signal



Signal sent to Terminal 4 of CN2 when everything is normal.

Signal sent to Terminal 4 of CN2 when there is a fault.

Identification of defects in LED 1, LED 2 and LED3

LED 1

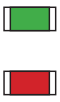
Led off	**Led on**

LED 2

Led off	**Led on**	**1 flash per seconde**	**6 flashes per seconde**
	Thermal fault	Blocking / overload motor	Insufficient input voltage fault

LED 3

Led off	**Led on**	**1 flash per seconde**	**6 flashes per seconde**
The error occurred one time	The error occurred for the third time (Series of same error)	The error occurred two time (Same error that the first)	The error occurred two time (Different error that the first)
			The error occurred three time (Same error that the first and the second)

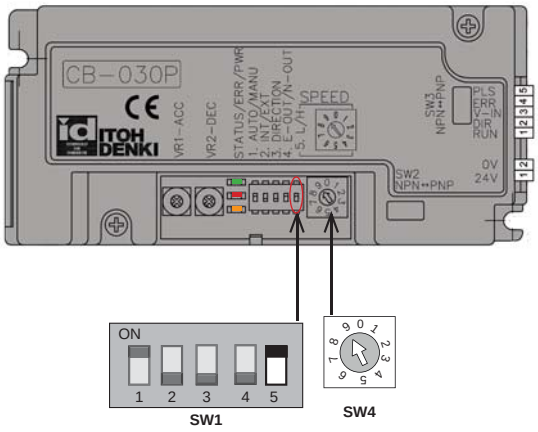
LED 1 / LED 2	Error signal input SW1-4 OFF	Error signal input SW1-4 ON	Motorized roller condition	Cause / symptom	Error signal reset	Motorized roller restart
	No signal	Signal sending	N.A.			
	No signal	No signal	Stopped	No power	Connect the 24 VDC power supply.	Standard start-up. See chapter 5.
	Signal sending	No signal	Stopped	Circuit board damaged	Remove power then replace the circuit board.	Standard start-up. See chapter 5.
	Signal sending	No signal	Stopped	Thermal fault	**Automatic restart (SW1-1 OFF)**	
					1 minute after drops below the thermal trip threshold, the motorized roller restarts immediately	
					1 minute after drops below the thermal trip threshold, the injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2 removes the error signal and restarts the motorized roller at the same time.	
					1 minute after drops below the thermal trip threshold, injection signal RUN ⇨STOP⇨ RUN on terminal 2 of CN2	Injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2
						Automatic restart in 1 minute
					Manuel restart (SW1-1 ON)	
					1 minute after drops below the thermal trip threshold, the injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2 removes the error signal and restarts the motorized roller at the same time.	
					After drops below the thermal trip threshold, injection signal RUN ⇨STOP⇨ RUN on terminal 2 of CN2	Injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2
	Signal sending	No signal	Stopped	Connector CN3 disconnected	Remove power and properly connect the motorized roller.	Standard start-up. See chapter 5.
	Signal sending	No signal	Stopped	The motorized roller is jammed for more than 4 seconds. (*)	Injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2 to reset and restart.	
					Injection signal RUN ⇨STOP⇨ RUN or STOP ⇨RUN ⇨ STOP on terminal 2 of CN2	Injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2
	No signal	Signal sending	Run	Overload	Remove the overload cause.	
	Signal sending	No signal	Stopped	Input voltage insufficiente (<18VDC)	**Automatic restart (SW1-1 OFF)**	
					Secure the supply voltage above 18VDC.	Immediate restart
					Manuel restart (SW1-1 ON)	
					Secure the supply voltage above 18VDC. Then the injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2 removes the error signal and restarts the motorized roller at the same time.	
					Secure the supply voltage above 18VDC. Then the injection signal RUN ⇨STOP⇨ RUN or STOP ⇨RUN ⇨ STOP on terminal 2 of CN2	Injection signal RUN ⇨STOP⇨ RUN on terminal 1 of CN2

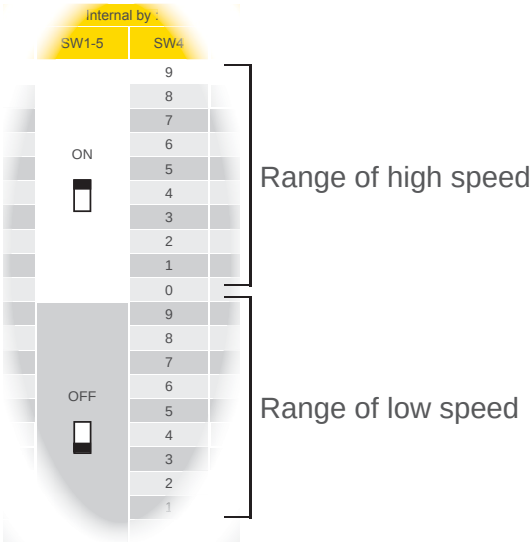
* The error signal can be removed by removing power for more than 2 seconds.

Led 2 (Red)	Led 3 (Orange)	Appearance	State
		First time	Thermal fault
		Second time	Blocking / Overload motor
		Third time or more	Thermal fault
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Blocking / Overload motor
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Thermal fault
		First time	Blocking / Overload motor
		Second time	Blocking / Overload motor
		Third time or more	Insufficient input voltage
		First time	Blocking / Overload motor
		Second time	Insufficient input voltage
		Third time or more	Blocking / Overload motor
		First time	Blocking / Overload motor
		Second time	Insufficient input voltage
		Third time or more	Insufficient input voltage
		First time	Insufficient input voltage
		Second time	Blocking / Overload motor
		Third time or more	Blocking / Overload motor
		First time	Insufficient input voltage
		Second time	Blocking / Overload motor
		Third time or more	Insufficient input voltage
		First time	Insufficient input voltage
		Second time	Insufficient input voltage
		Third time or more	Blocking / Overload motor
		First time	Insufficient input voltage
		Second time	Insufficient input voltage
		Third time or more	Insufficient input voltage
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Insufficient input voltage
		First time	Thermal fault
		Second time	Insufficient input voltage
		Third time or more	Thermal fault
		First time	Thermal fault
		Second time	Insufficient input voltage
		Third time or more	Insufficient input voltage
		First time	Insufficient input voltage
		Second time	Thermal fault
		Third time or more	Thermal fault
		First time	Insufficient input voltage
		Second time	Thermal fault
		Third time or more	Insufficient input voltage

Led 2 (Red)	Led 3 (Orange)	Appearance	State
		First time	Thermal fault
		Second time	Blocking / Overload motor
		Third time or more	Thermal fault
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Blocking / Overload motor
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Thermal fault
		First time	Blocking / Overload motor
		Second time	Blocking / Overload motor
		Third time or more	Insufficient input voltage
		First time	Blocking / Overload motor
		Second time	Insufficient input voltage
		Third time or more	Blocking / Overload motor
		First time	Blocking / Overload motor
		Second time	Insufficient input voltage
		Third time or more	Insufficient input voltage
		First time	Insufficient input voltage
		Second time	Blocking / Overload motor
		Third time or more	Blocking / Overload motor
		0	Normal
		First time	Insufficient input voltage
		Second time	Blocking / Overload motor
		Third time or more	Insufficient input voltage
		First time	Insufficient input voltage
		Second time	Insufficient input voltage
		Third time or more	Blocking / Overload motor
		First time	Insufficient input voltage
		Second time	Insufficient input voltage
		Third time or more	Insufficient input voltage
		First time	Thermal fault
		Second time	Thermal fault
		Third time or more	Insufficient input voltage
		First time	Thermal fault
		Second time	Insufficient input voltage
		Third time or more	Thermal fault

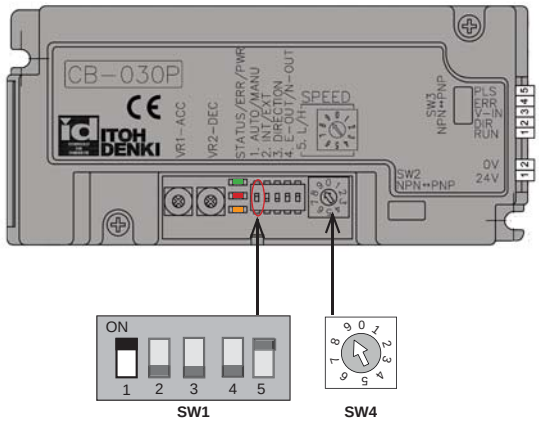
SW1 - Dip-switch 5 : Selection speed range





• Dip-switch 5 of SW1 allows to choose range of high or low speed.

9. SW4 : Selection fixed speed



Exemple : PM605KT serie - Speed code 55

Dip-switch SW1		SW4	Speed
2	5		
OFF	ON		38,2
	OFF		30,0

• Selection of a speed set using 10-position rotary switch SW4 (from 0 to 9)

• By combining this with dip-switch 1 of SW1, this allows a total of 20 speeds to be obtained.

Annexe 1

Incorporation declaration
in accordance with the EC Machinery Directive 2006/42/EC, Annex II B

The manufacturer :

ITOH DENKI CO., Ltd
1146-2 Asazuma-Cho, Kasai, Hyogo 679-0180 Japan

Distributed in Europe by:

ITOH DENKI Europe SAS
490 avenue des Jourdies - ZAE les Jourdies - BP 323
74807 St Pierre en Faucigny Cedex - France

hereby declares that the product series:

Circuit board CB030

is an incomplete machine as defined in the EC Machinery Directive and therefore does not fully meet the requirements of this Directive. Service entry is prohibited until the whole machine/system in which it is incorporated is declared to be in compliance with the EC Machinery Directive.

The health and safety requirements of Annex I have been applied. The special technical documents in accordance with Annex VII have been drawn up (and, if appropriate, submitted to the competent authorities).

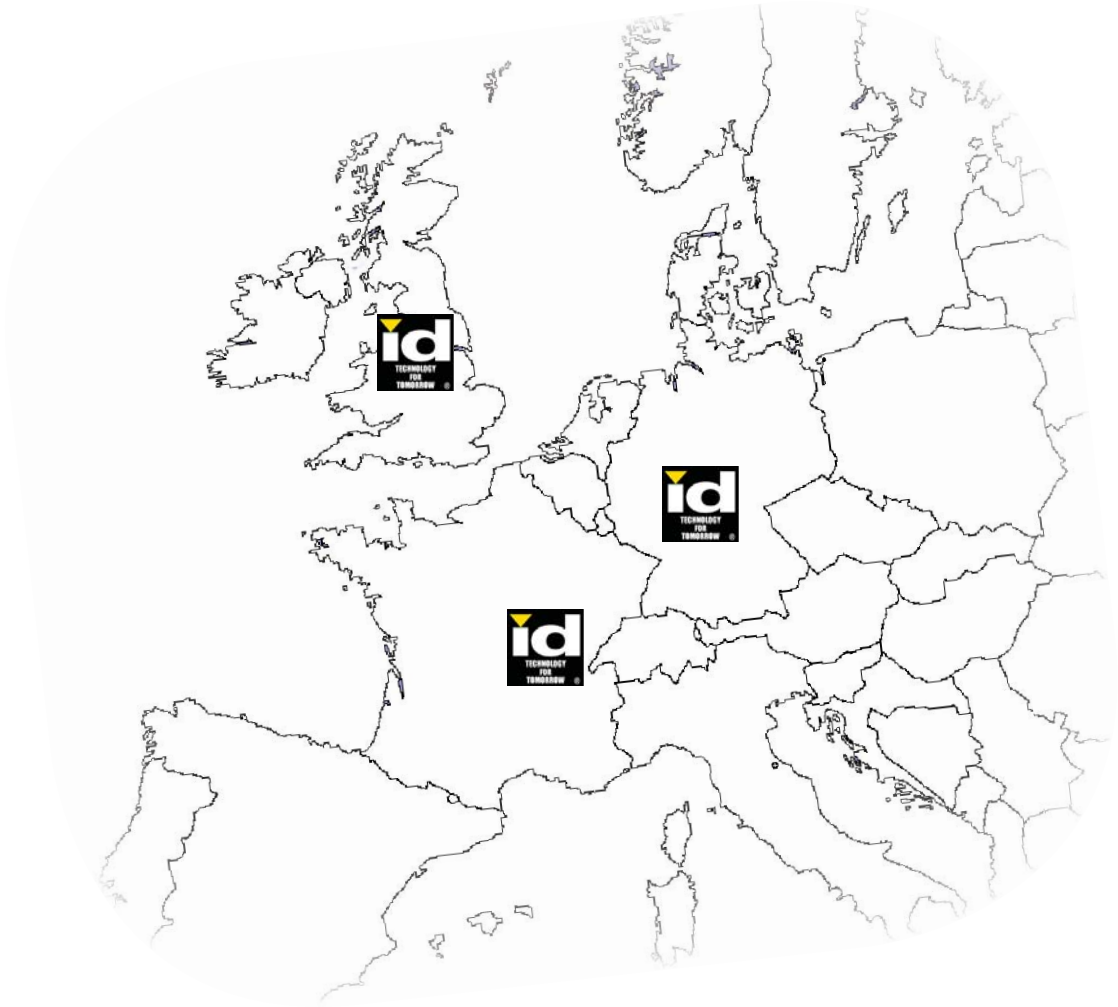
Person authorized to compile the technical documentation :

Toshiyuki TACHIBANA
ITOH DENKI CO., Ltd
1146-2 Asazuma-Cho, Kasai, Hyogo 679-0180 Japan

EC Directives applied:
- **Machinery Directive 2006/42/CE**
- **European EMC Directive CEM 2004/108/CE**
- **European RoHS Directive RoHS 2011/65/EU**

Saint Pierre en Faucigny, 17 february 2015

K. TAMURA, Managing Director



ITOH DENKI EUROPE S.A.S.

490 Av. des Jourdies
Z.A.E. les Jourdies
74800 St Pierre en Faucigny - France
Tél. : +33 (0)4 50 03 09 99
Fax : +33 (0)4 50 03 07 60
E-mail : info@itoh-denki.com

SUCCURSALE ITOH DENKI ANGLETERRE

Suite 1 Trinity Space Centre
Waldorf Way
Wakefield WF2 8DH - UK
Tel : +44 (0)1924 366 539
Fax : +33 (0)4 50 03 07 60
E-mail : info@itoh-denki.com

SUCCURSALE ITOH DENKI ALLEMAGNE

Neumeyerstrabe 48
90411 NÜRNBERG - Deutschland
Tel : +49 911 25 26 - 200
Fax : +49 911 25 26 - 201
E-mail : info@itoh-denki.de