

SAIA BURGESS CONTROLS

## Saia ${ }^{\circledR}$ Tillbehör



## (M) Malthe Winje

08-59411830 www.mwa.se info@mwa.se

## A5

## Cabinet components

The comprehensive range of accessories for automation technology from Saia ${ }^{\circledR}$ makes reliable operation of the systems possible. In addition to power supplies and Ethernet switches, modules such as isolating amplifiers, coupler modules and relays are available.


### 5.1 Saia ${ }^{\circ}$ Power supplies

### 5.2 Saia ${ }^{\oplus}$ industrial Ethernet switch

Industry-quality compact switches for top-hat rail mounting with 5 or 8 ports

### 5.3 Saia ${ }^{\circ}$ RS-485 bus termination box

Page 135
Termination box for the termination of RS-485 networks for top-hat rail mounting

with 24 V or 230 V power supply
5.4 $\mathrm{Saia}^{\circ}$ isolating amplifiers

Page 136
Isolating amplifiers for electrical isolation of analog signals from the switch cabinet potential
5.5 Saia ${ }^{\circ}$ coupler modules with manual operation

Page 137
Coupler modules to control drives, valves or flap systems


### 5.6 Saia ${ }^{\ominus}$ timer delay relays


5.7 Saia ${ }^{\circ}$ monitoring relays

Voltage, current and symmetry monitoring, and short-circuit and cable-break monitoring of motors


### 5.1 Saia ${ }^{\circledR}$ Power: Power supplies with 24 VDC output

Thanks to their high level of resistance to interference, the power supplies from Saia ${ }^{\oplus}$ provide an ideal power supply for automation solutions. As they can be heavily overloaded for a short period, high-output loads can also be operated with them. The full extent of their flexibility can be seen in the option of connecting multiple devices in parallel in order to increase the maximum output current or connecting them in series in order to achieve different voltage levels.

## Power unit overview

Saia ${ }^{\oplus}$ Power Flex single phase 110/230 VAC

- Q.PS-AD2-2402F (up to 3 A)
- Q.PS-AD2-2405F (up to 7.5 A)
- Q.PS-AD2-2410F (up to 14 A)

Saia ${ }^{\oplus}$ Power Flex single phase or double phase 230/400 VAC - Q.PS-AD3-2405F (up to 7.5 A)

Uninterruptible power supply single phase 110/230 VAC with intelligent battery charger

- Q.PS-ADB-2405-1 (5 A)

Saia ${ }^{\circ}$ CC single phase 28 VAC/40 VDC

- Q.PS-AD1-2403 (3 A)
- Q.PS-AD1-2405 (5 A)



## System properties in general

- Short-circuit protection
- Overload protection
- IP 20 housing for mounting on DIN rail


## Properties of Flex types 24xxF

- Power boost: $+40 \%$ extra output current up to $60^{\circ} \mathrm{C}$ for at least 3 minutes
- With AD2/3-2405F and 2410F, different short-circuit modes available
- 'Power good' relay for status display
- With 2410F, simple parallel connection (via jumper) to increase max. output current
- In serial mode, output voltage up to 150 VDC possible
- Extremely small size
- AD3-2405F can be used as either a single phase or double phase power unit



## Properties of the uninterruptible power supply

- 3-stage automatic charging curve to compensate the self discharge of the battery
- Automatic real-time diagnosis of the battery status and test function to find out the lifetime of the battery
- Any battery fault can be easily identified via blinking codes of the diagnostics LED
- Option of status and battery fault reporting in the control system via 2 potential-free contacts
- Adjustable charging current $1 . . .5 \mathrm{~A}$


## Norms and certifications

- According to EMC 2004/108/EEC and Low voltage 2006/95/EEC


## Electrical safety:

According to IEC/EN60950 (VDE 0805) and EN50178 (VDE0160) for assembling devices. The unit must be installed according to IEC/EN56090.
EMC Generic:
Immunity according to EN61000-6-2
Noise emission according to EN61000-6-4

### 6.1 Saia ${ }^{\circledR}$ Power: Technical data



## Overload protection

Jumper Characteristic
Mode

Continuous out mode

The output current remains at a high value and the output voltage is almost 0 volts.


Jumper Characteristic

$-25 \ldots+70^{\circ} \mathrm{C}$
$-40 \ldots+85^{\circ} \mathrm{C}$
$95 \%$ at $+25^{\circ} \mathrm{C}$

Mode

Hiccup mode
Automatic restart (default setting) Attempts to switch on the output voltage again every 2 seconds.

Manual rest mode
For a restart, it is necessary to switch off the input voltage for
approx. 1 minute.




| Q.PS-AD3-2405F | Q.PS-ADB-2405-1 <br> Battery type | Q.PS-AD1-2403 | Q.PS-AD1-2405 |
| :---: | :---: | :---: | :---: |
| 230 VAC / 400... 500 VAC | 115...230 VAC | $28 \mathrm{VA} / 40 \mathrm{VDC}$ |  |
| 187... 264 VAC / 330... 550 VAC | 93... 264 VAC | 24... $32 \mathrm{VAC} / 33 . . .45 \mathrm{VDC}$ |  |
| $\leq 17 \mathrm{~A} \leq 5 \mathrm{~ms}$ | $\leq 14 \mathrm{~A} \leq 5 \mathrm{~ms}$ |  |  |
| $47 . . .63 \mathrm{~Hz}$ ( $\pm 6 \%$ ) |  |  |  |
| 1.5 / 0.8 A | 1.5...0.9 A |  |  |
| 4 A |  | --- |  |
| Fast-acting 10 A | Fast-acting 6 A | Fast-acting 4 A | Fast-acting 6 A |
| $24 \mathrm{VDC} \pm 3 \% / 5 \mathrm{~A}$ | $24 \mathrm{VDC} / 5 \mathrm{~A}$ | $24 \mathrm{VDC} \pm 2 \% / 3 \mathrm{~A}$ | $24 \mathrm{VDC} \pm 2 \% / 5 \mathrm{~A}$ |
| 22... 27 VDC | --- |  |  |
| 1 s (max.) | 2.5 s (max.) | $\leq 100 \mathrm{~ms}$ |  |
| $\leq 50000 \mu \mathrm{~F}$ | $\leq 30000 \mu \mathrm{~F}$ | $\leq 30000 \mu \mathrm{~F} / 1.5 \mathrm{~A}$ | $\leq 30000 \mu \mathrm{~F} / 2 \mathrm{~A}$ |
| 7.5 A | --- |  |  |
| 6.0 A | --- | 3 A | 3.5 A |
| 5.0 A | --- |  |  |
| --- | $1.1 \times I_{n} \pm 5 \%$ | $1.05 \times \mathrm{I}_{\mathrm{n}} \pm 7 \%$ |  |
| 7.5 A | --- |  |  |
| 16 A | --- |  |  |
| $\leq 80 \mathrm{mVpp}$ | $\leq 60 \mathrm{mVpp}$ |  |  |
| $\geq 91 \%$ | $\geq 81 \%$ | $\geq 88 \%$ |  |
| Yes + 3 modes | Yes |  |  |
| Yes |  |  |  |
| Yes (max. 35 VDC ) | Yes | --- |  |
| Yes | --- |  |  |


| $1 \mathrm{~A} / 30 \mathrm{VDC}$ | $1 \mathrm{~A} / 30 \mathrm{VDC}$ |  |  |
| :---: | :---: | :---: | :---: |
| Yes |  |  |  |

$-25 \ldots+70^{\circ} \mathrm{C}-\left(\right.$ Derating $\left.>50^{\circ} \mathrm{C}, 2.5 \% /{ }^{\circ} \mathrm{C}\right)$
$-40 \ldots+85^{\circ} \mathrm{C}$
$-0 \ldots+50^{\circ} \mathrm{C}$
$95 \%$ at $+25^{\circ} \mathrm{C}$

| Battery output <br> (battery type 3 ... 50 Ah ) |  |
| :---: | :---: |
| Boost charge ( $25^{\circ} \mathrm{C}$ ) (at $\mathrm{I}_{\mathrm{n}}$ ) | 28.8 VDC |
| Trickle charge ( $25^{\circ} \mathrm{C}$ ) (at $\mathrm{I}_{\mathrm{n}}$ ) | 27.5 VDC |
| Output 2: Battery charging current max. $I_{\text {batt }}$ | $5 \mathrm{~A} \pm 5 \%$ |
| Setting range of charging current | $20 . . .100 \%$ of ${ }_{n}$ |
| Recovery charge after deep discharge | Yes |
| Configuration jumper: Battery type | Yes |
| Reverse polarity protection | Yes |
| Monitoring of the sulfation of the battery cells | Yes |
| Detection of an element in short circuit | Yes |
| Load output |  |
| Output voltage (at $\mathrm{I}_{\mathrm{n}}$ ) | 22...28.8 VDC |
| Max. nominal current $I_{n}=I_{\text {load }}+I_{\text {batt }}$ (120 W) | $1.1 \times 5 \mathrm{~A} \pm 5 \%$ |
| Output 1: Load current (main) $\mathrm{I}_{\text {load }}$ | 15 A max. |
| Output 1: Load current (backup) $\mathrm{I}_{\text {load }}$ | 10 A max. |
| Signal output <br> (floating switch contacts) |  |
| Switching capacity | $1 \mathrm{~A} / 30 \mathrm{VDC}$ |
| Main or backup power | Yes |
| Defective battery/low battery | Yes |

## Output characteristics

## Output derating curve

 Q.PS-AD2-2402F

Output derating curve Q.PS-AD2-2405F Q.PS-AD3-2405F


Output derating curve
Q.PS-AD1-2403
Q.PS-AD1-2405
Q.PS-ADB-2405-1


Output derating curve Q.PS-AD2-2410F


### 5.2 Saia ${ }^{\circledR}$ industrial Ethernet switch Q.NET-xTX

This compact, unmanaged switch operates according to the plug-and-work principle. The mounted switch is equal in height to Saia ${ }^{\oplus}$ PCD3 systems, which saves space when it is snapped onto the top-hat rail. The PCD controller is connected with the patch cable provided. With its robust construction, this switch is suitable for use in rugged industrial environments and in infrastructure automation.

## System properties

- Top-hat rail mounting and 24 VDC supply for trouble-free use in infrastructure automation and in rugged industrial environments
- Fast network diagnosis, due to integral LEDs at TCP ports
- Entry level industrial Ethernet rail switch, with store-andforward switching mode
- Allows construction of Ethernet networks according to IEEE 802.3 with copper technology
- The device has five or eight $10 / 100 \mathrm{Mbit} / \mathrm{s}$ twisted pair ports (RJ45 connections)
- Up to five or eight end devices or additional TCP segments can be connected to the TCP ports via twisted pair
- Extremely light, compact construction with IP30 protection level
- Simple commissioning with 'plug-and-work' via auto-negotiation, auto-polarity and auto-crossing

Technical data Q.NET-5TX and Q.NET-8TX



## Dimensions



### 5.3 Saia ${ }^{\circledR}$ RS-485 bus termination box PCD7.T16x

The PCD7.T16x termination boxes are used for RS-485 network termination.Each RS-485 network segment must be terminated at the end of the network. The PCD7.T16x termination boxes ensure that the RS-485 signals are set at the correct signal level and the integrated 120 Ohm resistor prevents signal reflection in the RS-485 cable. With their robust and compact construction, as well as the electrically isolated power supply with either 230 VAC or $24 \mathrm{VAC} / \mathrm{DC}$, the PCD7.T16x termination boxes are suitable for use in rugged industrial environments and in infrastructure automation.
An LED indicates the presence of the supply voltage of the PCD7.T16x termination box.

## System properties

- 35 mm top-hat rail mounting
- 17.5 mm wide housing
- 230 VAC $+15 \% /-20 \%$ for PDC7.T161
- 24 VAC / DC - 15 \% /+15 \% for PDC7.T162
- Current consumption of 0.4 W
- Electrically isolated power supply
- Fixed line termination resistance of $120 \Omega$
- LED operating indicator

| System properties |
| :--- |
|  |
| 35 mm top-hat rail mounting |
|  |
| 17.5 mm wide housing |
| $230 \mathrm{VAC}+15 \% /-20 \%$ for PDC7.T161 |
|  |
| Current consumption of 0.4 W |
|  |
|  |
|  |
|  |
|  |



## Connection diagram



Dimensions


|  | PCD7.T161 | PCD7.T162 | Comments |
| :--- | :--- | :--- | :--- |
| Power supply | 230 VAC | 24 VAC / DC |  |
| Housing | $17.5 \times 85 \times 64 \mathrm{~mm}$ | $17.5 \times 85 \times 64 \mathrm{~mm}$ | PCD7.T161 and PCD7.T162 <br> comply with the standards for <br> switch cabinets |
| Line termination resistance | Fixed $120 \Omega$ |  |  |
| Display | LED for 230 VAC | Lixed $120 \Omega$ |  |
| Lead-sealing cap as an accessory, see section 4.3 .6 (ALD1) |  |  |  |

### 5.4 Saia ${ }^{\circledR}$ isolating amplifiers DC/DC KFD1x

The Saia ${ }^{\otimes}$ isolating amplifiers KFD1x isolate individual analog channels not only from input to output, but also from the supply and from frame ground potential. This electrical separation is particularly recommended for long lines in large installations. However, the Saia ${ }^{\ominus}$ KFD1 can also be used to amplify a weak signal and convert it into a noise-proof current signal.

## System properties

- Available in two versions with different input ranges
- Conversion time 20 ms
- $0.5 \%$ accuracy at full scale
- Output electrically isolated from input with optical isolating amplifier


Technical data for isolating amplifiers DC/DC KFD11 and KFD12

| Input ranges ${ }^{1}$ ) KFD11 | $0 . . .10 \mathrm{VDC}$, input impedance $200 \mathrm{k} \Omega$ or $0 . . .20 \mathrm{~mA}$, load $47 \Omega^{2}$ ) |
| :---: | :---: |
| KFD12 | 0 .. 75 VDC , input current $0 . . .20 \mathrm{~mA}$ or $0 . . .60 \mathrm{mV}$, input current $0 \ldots 60 \mu \mathrm{~A}^{3}$ ) |
| Output ranges ${ }^{\mathbf{1}}$ ) | $0 . . .10 \mathrm{VDC}$, load ( $\geq 3 \mathrm{k} \Omega$ ); <br> $0 . . .20 \mathrm{~mA}$, load ( $\leq 500 \Omega$ ) |
| Input/output | electrically isolated with optical isolating amplifier |
| Conversion time | 20 ms |
| Short-circuit proof: | yes, 1 minute, fault current <100 mA |
| Status display | LED green: supply voltage present |
| Isolating characteristics | 800 VDC between supply, input and output |
| Accuracy | 0.5\% of final value |
| Supply voltage | 19... 70 VDC or $24 \mathrm{~V} \pm 20$ \% full-wave rectified |
| Power consumption | 1.0...2.4 W depending on voltage and load |
| Duty cycle | 100\% |
| Terminals | screw terminals for $1 \times 0.5 \mathrm{~mm}^{2}$ to $2 \times 2.5 \mathrm{~mm}^{2}$ |
| Mounting | surface mounting; snap-on mounting onto top-hat rail according to DIN EN60715 TH35 (formerly DIN EN50022) $(1 \times 35 \mathrm{~mm})$ or screw fixing by adapter (accessory) and 2 screws M4 |
| Ambient temperature Operation Storage | $\begin{aligned} & 0 \ldots 50^{\circ} \mathrm{C} \\ & -25 \ldots+70^{\circ} \mathrm{C} \end{aligned}$ |
| Humidity | $95 \% \mathrm{RH}$ with no condensation |
| EMC/interference immunity | EN61000-4-4 (2 kV) at input and output EN61000-4-4 (4 kV) at supply |
| EMC/emissions | EN55022, class B |
| ${ }^{1}$ ) 2 input ranges/ 2 output ranges sele <br> ${ }^{2}$ ) Overvoltage protection by stress lin <br> ${ }^{3}$ ) Overcurrent or overvoltage protect | le with 2 slide switches on front panel 27 V max. <br> by stress limiter |

## Ordering information

Isolating amplifiers DC/DC KFD11 and KFD12
KFD11JVTN

## Dimensions



Block diagram


### 5.5 Coupler modules with manual operation to control drives, valves or flap systems

|  | PCD7.L252: Changeover switch with manual control level Auto/OFF/ON | PCD7.L452: Analog value transmitter for manual correcting variables | PCD7.L260: Coupler module for two-stage motor control |
| :---: | :---: | :---: | :---: |
| Dimensions <br> PCD7.L252/452 |  |  |  |
|  | - 1 changeover switch <br> - Manual control level <br> - Auto acknowledge <br> - LED indicator <br> - 11.2 mm overall width <br> - Spring terminals | - Potentiometer 0... 10 V <br> - Manual control level <br> - Auto acknowledge <br> - LED indicator <br> - 11.2 mm overall width <br> - Spring terminals | - Interlocked relay <br> - Manual control level <br> - Auto acknowledge <br> - LED indicator <br> - 22.5 mm overall width <br> - Screw terminals |
|  | Single-stage coupler component with manual control level, acknowledgement of switch position and an LED for status indication. <br> Spring terminals allow for quick and easy wire connection. Thanks to additional terminals, the supply voltage can be connected across jumpers without any wiring effort and additional time being involved. | The analog data encoder has three operating modes: ON, OFF and AUTO. In switch position AUTO, the control variable will be looped unchanged via the YR terminal to the control variable output Y . In switch position ON, the control variable can be set using the potentiometer on the front of the device. The output signal will be available at terminal Y . | When switching back from stage 2 to stage 1 , stage 2 is switched off first and, after a <60 ms delay, stage 1 is switched on. A manual control level has been integrated for service purposes. The time function is operational here too. |
| Input side | PCD7.L252 | PCD7.L452 | PCD7.L260 |
| Supply voltage | 24 VDC/VAC, -15\%/+10\% | 24 VDC/VAC, $-15 \% /+20 \%$ | $24 \mathrm{VDC} / \mathrm{VAC}, \pm 10 \%$ |
| Current draw | 13 mA , protection wiring with recovery diode | 19 mA at 24 VDC 30 mA at 24 VAC | 30 mA |
| Input current | --- | 2 mA at 10 VDC (input YR) | max. 4 mA , terminal B1/B2 |
| Response / release time | $10 \mathrm{~ms} / 5 \mathrm{~ms}$ | ------ | $20 \mathrm{~ms} / 20 \mathrm{~ms}$ |
| Input voltage | $24 \mathrm{VDC} / \mathrm{VAC}$ | $0 . . .10 \mathrm{VDC}$ | $24 \mathrm{VDC} / \mathrm{VAC}$ |
| Operating indicator | Green LED to indicate relay state | Red LED (brightness in proportion to control variable) | Two red LEDs to indicate relay state |
| Output side |  |  |  |
| Output contact | 1 changeover | --- | 1 changeover with 0 position |
| Turn-on voltage | max. 250 VDC/VAC | --- | max. 250 VDC/VAC |
| On / off switching current | max. 8 A | ------ | max.6A |
| Output voltage | --- | $0 . .10$ VDC, max. 10 mA , output Y in switch position Auto/ON | --- |
| Constant current | 8 A | --- | 4A |
| Breaking capacity (ohmic load) | $\begin{aligned} & 24 \mathrm{VDC} / 180 \mathrm{~W} \\ & 50 \mathrm{VDC} / 65 \mathrm{~W} \\ & 230 \mathrm{VDC} / 50 \mathrm{~W} \\ & 250 \mathrm{VAC} / 2000 \mathrm{VA} \end{aligned}$ | --- <br> --- <br> --- <br> - | $24 \mathrm{VDC} / 150 \mathrm{~W}$ $50 \mathrm{VDC} / 25 \mathrm{~W}$ $230 \mathrm{VDC} / 50 \mathrm{~W}$ $230 \mathrm{VAC} / 1500 \mathrm{VA}$ |
| Breaking capacity min. | $24 \mathrm{VDC} / 20 \mathrm{~mA}$ | --- | $24 \mathrm{VDC} / 20 \mathrm{~mA}$ |
| Service life mechanical electrical (at maximum switching load) | $2 \times 10^{7}$ switch cycles <br> $1 \times 10^{5}$ hystereses | ---- | $1 \times 10^{7}$ switch cycles <br> $1 \times 10^{5}$ hystereses |
| Switching frequency | max. 300 hystereses / h at max. current | --- | max. 1,200 hystereses / h at max. current |


| Accessories | Jumper for connection of the supply voltage of <br> up to 10 PCD7.L252 and PCD7.L452 modules |
| :--- | :--- |
| PCD7.L291 | Labeling plate for PCD7.L452 |
| PCD7.L490 | Labeling plate for PCD7.L252 |
| PCD7.L290 |  |

### 5.6 Saia ${ }^{\circledR}$ timer delay relays



## Dimensions

KOL251 and KOL260

KOP160 and KOP170


KOP219 and KOPP560

Series $\qquad$ KOP
KOPxxx.K... Order reference

| Functions | \% | $\underline{\square}$ | \% | $\underline{1}$ | $\underline{1}$ | $\underline{\square}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Delayed operation | --- | - | - | --- | -- | - |
| Delayed release | --- | $\bullet$ | $\bullet$ | --- | --- | $\bullet$ |
| Delayed release after failure of operating voltage | --- | --- | --- | --- | - | --- |
| Delayed operation and release | --- | --- | - | --- | --- | - |
| Fleeting-on delay timer | --- | - | $\bullet$ | --- | --- | - |
| Fleeting-off delay timer | --- | --- | $\bullet$ | --- | - | - |
| Flasher relay | --- | - | --- | --- | --- | --- |
| Star-delta timer | - | --- | --- | --- | --- | --- |
| Pulse converter | --- | --- | - | --- | --- | - |
| Pulse generator | --- | --- | - | --- | - | $\bullet$ |
| Flasher relay with pulse starting | --- | --- | - | --- | --- | - |
| Asymmetrical pulse generator | --- | --- | --- | - | --- | --- |
| On/off function for startup and maintenance | --- | --- | - | --- | --- | - |
| Time ranges |  |  |  |  |  |  |
| 0.15 s ... 10 min | $\bullet$ | --- | --- | --- | $\bullet$ | --- |
| $0.05 \mathrm{~s} \ldots 10 \mathrm{~h}$ | --- | - | --- | --- | --- | --- |
| $0.05 \mathrm{~s} \ldots . .60 \mathrm{~h}$ | --- | --- | $\bullet$ | - | --- | - |
| Operating voltage |  |  |  |  |  |  |
| 24...48 VDC and 24... 240 VAC | - | - | $\bullet$ | - | --- | - |
| 24... 240 VDC or $24 . . .240$ VAC | --- | --- | --- | --- | - | --- |
| Contacts |  |  |  |  |  |  |
| 2 make contacts with a joint connection | - | --- | --- | --- | --- | --- |
| 1 changeover | --- | $\bullet$ | $\bullet$ | - | -- | --- |
| 2 changeovers | --- | --- | -- | --- | - | --- |
| 2 changeovers, instantaneous and/or timed contacts | --- | --- | --- | --- | --- | - |

### 5.7 Saia ${ }^{\oplus}$ Monitoring relays

KFE102 / 103 / 300 / 302

- Voltage and current monitoring, three-phase asymmetry monitoring
- Phase order, phase failure
- Three-phase voltage monitoring
- 230 VAC, $3 \times 400$ VAC $50 / 60 \mathrm{~Hz}$
- 1 changeover contact

KFT100 / 200

- Motor monitoring by PTC
- PTC short-circuit monitoring
- PTC cable-break monitoring with memory func-
tion (KFT200)
- 230 VAC
- 1 relay (NO contact, KFT100)
- 2 relays (changeover contact, KFT200)


Dimensions



