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VARIABLE SPEED DRIVES

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Digital Inverters

AP-AG1 Sub-assembly (DIN rail mounting)
A Type Encoder Adaption

0420

AMK

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1 Contents

2 Instruction for commissioning of the AP-AG1 sub-assembly

2.1 AP-AG1 Brief description

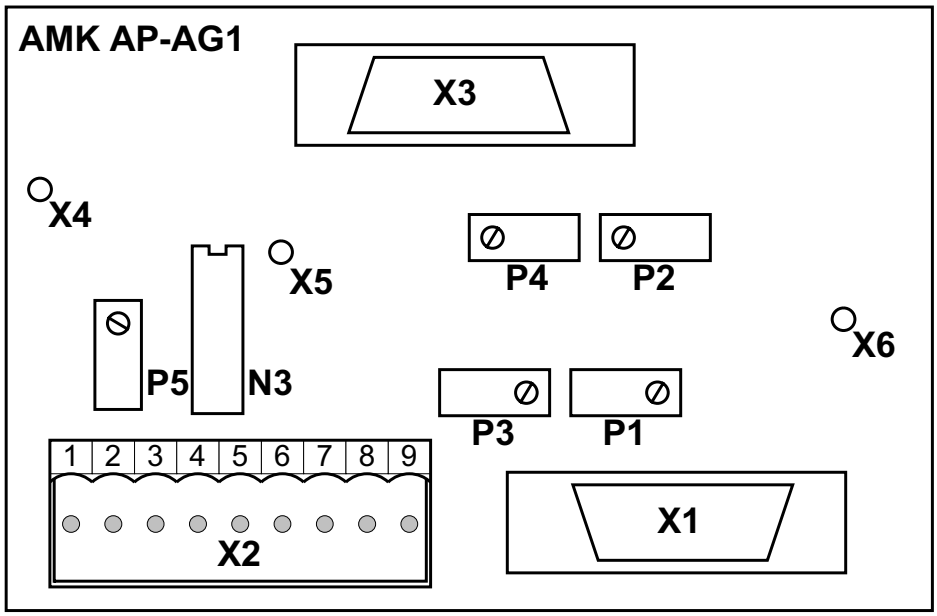
The AP-AG1 sub-assembly is processing A type encoder signals at the input X1 / X2.
On the AP-AG1 board these input signals are converted to signals which comply with the signals according to the I type encoder specification.
These encoder signals then can be fed to the encoder input of AW and KW modules via output connector X3.

On the AW / KW module “ID 32953 Encoder type” in this case must be set for I type encoder!

2.2 Requirements for commissioning

- + 5 V power supply, approx. 0.4 A maximum
  (e. g. from AW / KW module via encoder connector)
- 1 Motor with A type encoder
- AMKASYN system (AW / KW, set for I type motor encoder)
- Digital voltmeter
- 2 channel storage oscilloscope

2.3 Component mounting diagram



2.4 General

- All measurements must be related to ground (GND).

2.5 Commissioning

2.5.1 Visual check

Check component mounting, check the wiring.

2.5.2 Power supply

Turn on +5 Volt (plug in encoder cable).
Check voltage at IC1: Pin 8: + 5 Volt ± 0.5 Volt
Pin 5: - 5 Volt ± 1 Volt

2.5.3 Voltage reference

at R27: Set voltage: 2.5 V ± 0,2 V

2.5.4 AP-AG1 Adjustment

Conditions:

- A type encoder connected to X1 (for PUMASYN motors better use PHOENIX X2).

For basic adjustment:

- n_{MOTOR} = 0 min^{-1} , encoder not connected to the motor

For all additional adjustments:

- Connect encoder cable to the motor with A type encoder
- Turn motor shaft manually or by any other external means, $n_{MOTOR} \approx 300$ min^{-1}
- Signal representation -(S1+S2): Solder a 2.7kOhm resistor to X5 and X6 each, connect the free ends of the resistors ⇒ Measuring point for signal -(S1+S2)
- Reference potential for all measurements is GND of the 5v supply

	Trim by	Measure at	Setpoint	Tolerance	Meter
Basic adjustment	P1	X6	0 mV		Fluke, VDC
	P3	X5	0 mV		Fluke, VDC
Gain tuning	P2	X6	5,4 Vss	± 0.3 V	Scope, VAC
	P4	X5	5,4 Vss	± 0.3 V	Scope, VAC
Offset balancing	P1	X6	0 mV		Fluke, VDC
	P3	X5	0 mV		Fluke, VDC
Ref. pulse adjustment	P5	N3,1	0 mV		Scope, VDC
	P5	X4	Ch2: DC: -0.4V pulse: +0.3V position within +-180° ... +-45° to neg. ampl. of -(S1+S2)	CH1: - (S1+S2)	Scope, VDC

2.6 Pin assignment to AP-AG1 connection sockets

- X1 (15 pole SUB-D connector, female):
  Input from the A type encoder

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Housing
G0I	G0N	G1I	G1N	G2I	G2N	5P	GND	NC	NC	NC	NC	GND	NC	NC	Shield

- X2 (9 pole PHOENIX connector, male):
  Input from the A type encoder

01-	01	S1-	S1	S2-	S2	+5V	0V	
1	2	3	4	5	6	7	8	9
G0I	G0N	G1I	G1N	G2I	G2N	5P	GND	Shield

PUMASYN encoder signals

- X3 (15 pole SUB-D connector, male):
  Output to the inverter module (corresponding to I type encoder signals)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Housing
G0I	G0N	G1I	G1N	G2I	G2N	5P	GND	NC	NC	NC	NC	GND	NC	NC	Shield

2.7 Oscillograms

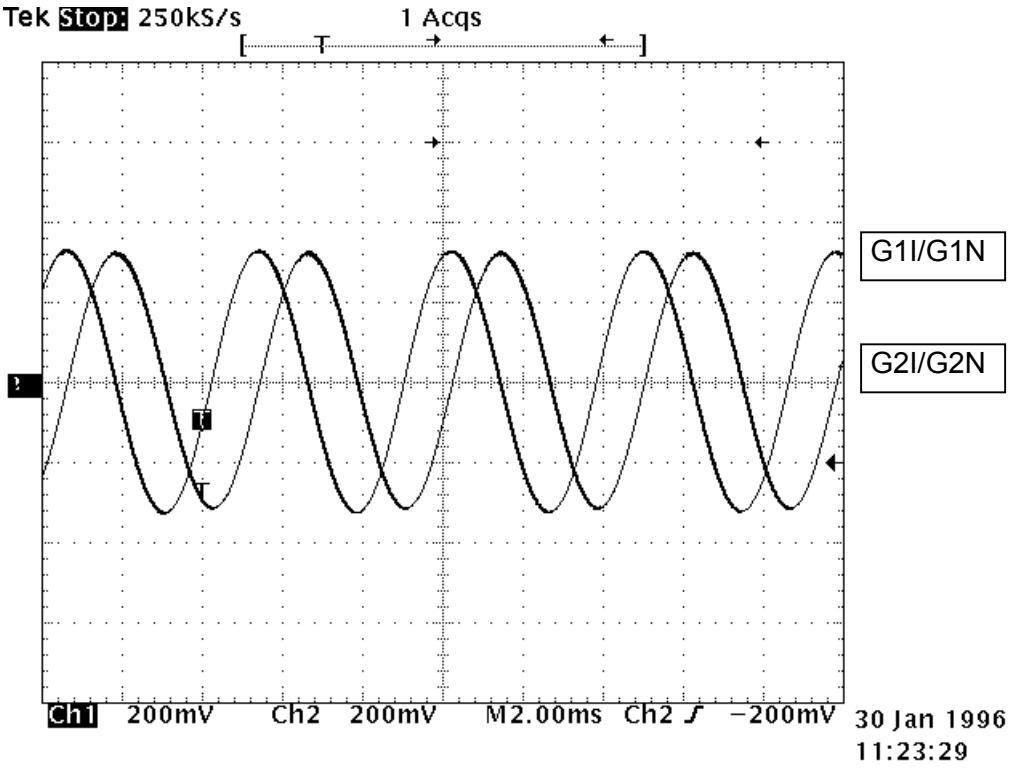


Figure1: Differential signals G1I/G1N und G2I/G2N measured at output X3

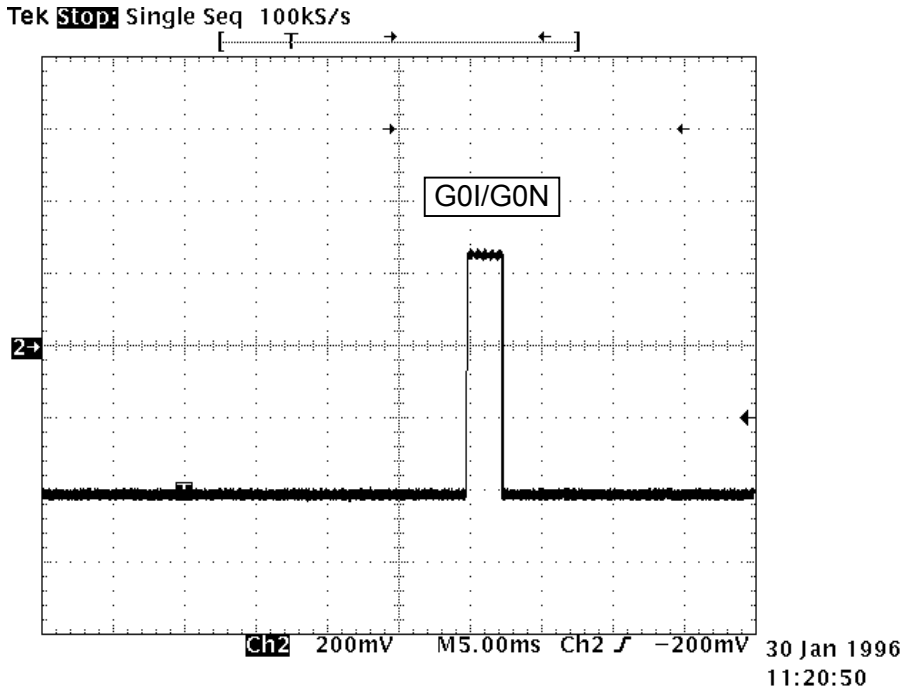


Figure 2: Differential signal G0I/G0N measured at X3

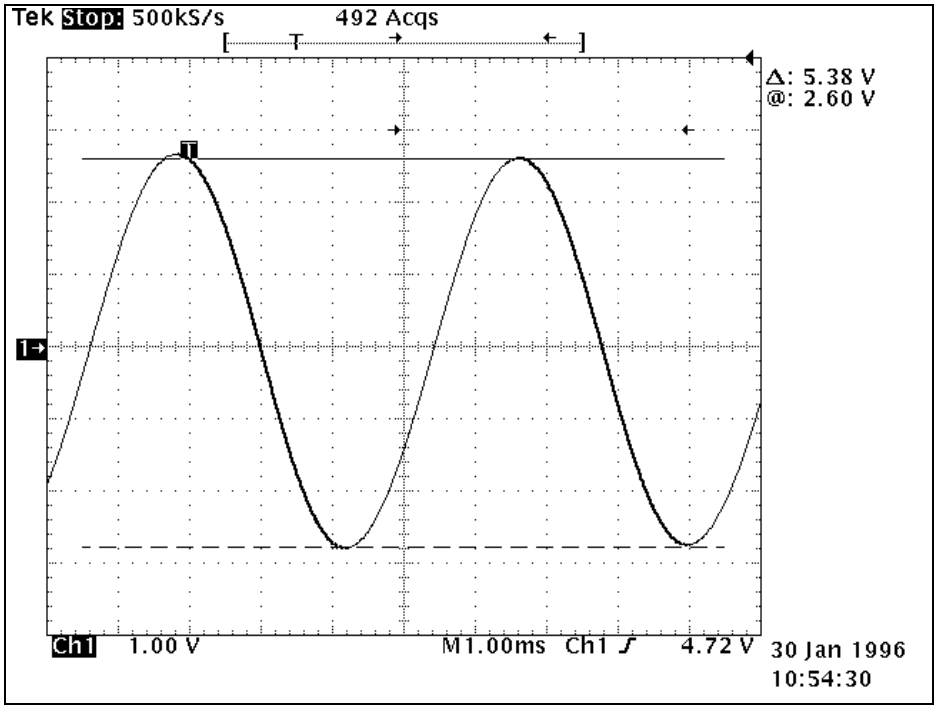


Figure 3: S1 measured at measuring point X6 against GND

Related to the zero line the sinusoidal signals S1 at X6 and S2 at X5 must be symmetrical (balancing through offset potentiometers P1 / P3). The gain then must be adjusted to 5,4V ± 0,3 V through potentiometers P2 / P4.

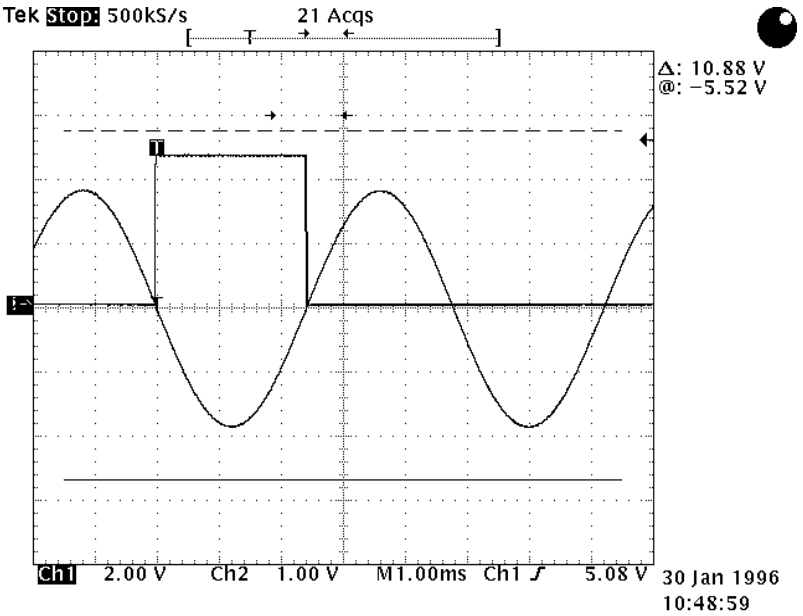


Figure 4: Reference pulse position related to **-(S1+S2)**