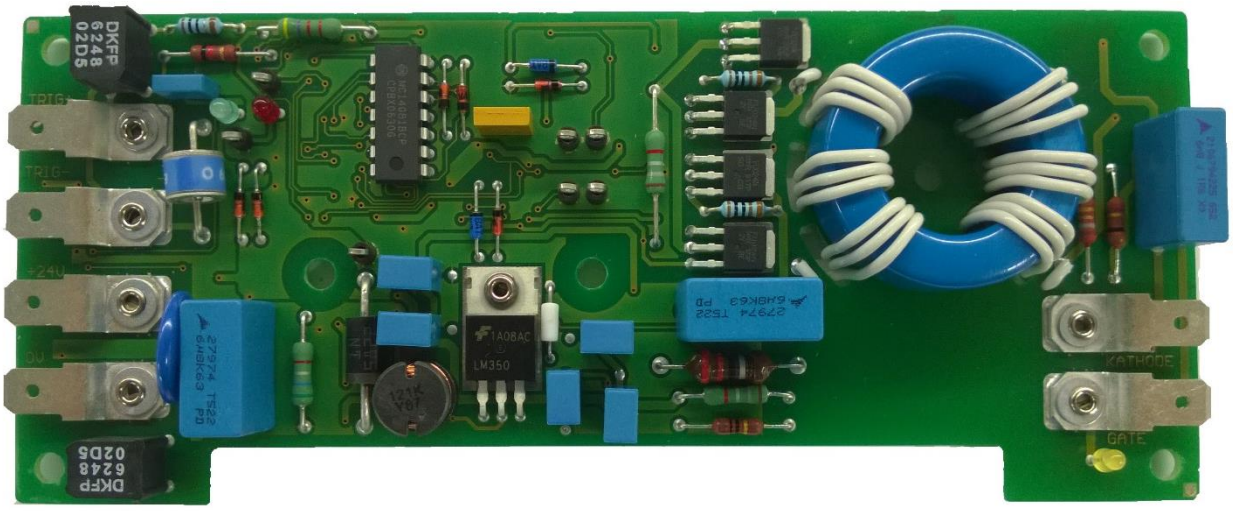
Manual

GU-SGMIII-RY-V1-01



Release date: 24.08.14

Rev.	Remarks / changes	created		checked		released	
01	Initial	AST	24.08.14	FF	09.09.14	AST	10.09.14

Table of Contents

1. Introduction

1.1. Purpose

The purpose of this document is to describe the function of the GU-SGMIII-RY-V1-01 thyristor gate unit.

1.2. Applicable documents 1.3.

Other related documents

Ref	Document Type	Document number / Link	Rev	Content
[1]				
[2]				
[3]				

Table 1: Related documents

1.4. Abbreviations and Terminology

GDU - Gate drive unit

1.5. Description

The gate unit is used to generate a turn-on gate pulse for Thyristors. An inductive coupling using a high voltage isolated closed loop cable ensures the triggering of the Thyristors at different potential levels.

1.6. Instructions for use

- Make sure that the device works correctly before using in a critical application.
- Make sure that all safety relevant actions are done

1.7. Block diagram

The picture below shows the block diagram of the GU-SGMIII-RY-V1-01.

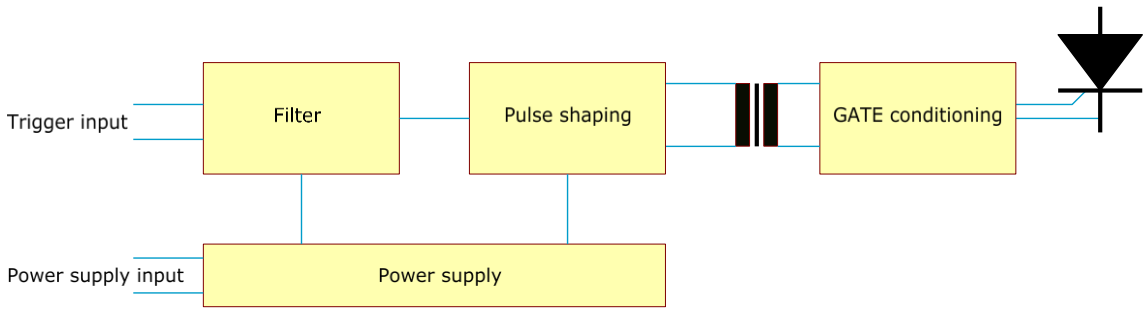


Figure 1 : Block diagram

2. Connectors and indicators

2.1. Power supply connector

The power supply connector is used to supply the board. Please be aware that only a small isolation (<500V) between input and output exist. Therefore be careful with the power supply and the attached thyristor that no high voltage on the cathode or gate may appear.

J200 : +VDC
J201 : -VDC

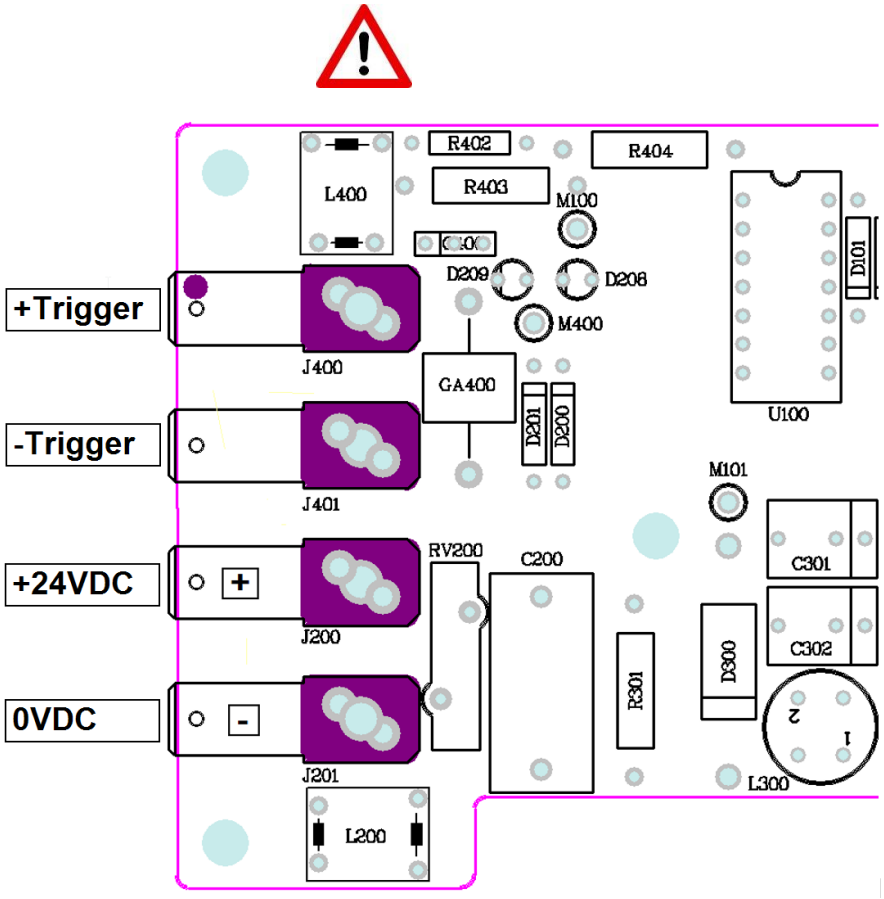


Figure 2 : Power supply input

2.2. Trigger input

The trigger input is used to trigger the thyristor. For the position of the two connectors see also picture above.

J400 : +Trigger
J401 : -Trigger

Parameter	Symbol	Min	Typ	Max	Unit
Thyristor Off		0	0	5	VDC
Thyristor On		14	24	28	VDC

2.3. Output connectors

Connector J100 and J101 are used to attach the thyristor to the gate unit.

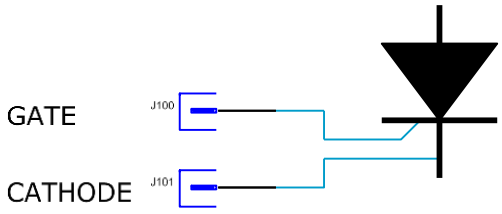


Figure 3 : Thyristor connection

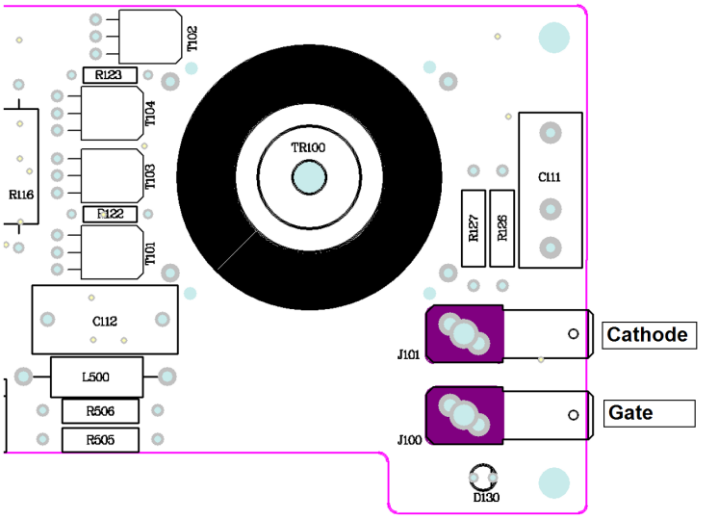


Figure 4 : Gate-Cathode connection

2.4. Indicators

The table below shows the different indicators and its meaning.

Parameter	Description	Color
D130	Will be lit when gate – cathode connection is open	Yellow
D208	Will be lit when power supply is out of range	Red
D209	Will be lit when power supply is ok	Green

2.5. Electrical interfaces

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Auxiliary power	V_{Sup_aux}		20	24	28	VDC
Auxiliary power consumption	P	Standby	-	-	1	W
	P	@1000Hz, 50% Duty cycle	-	-	2.5	W

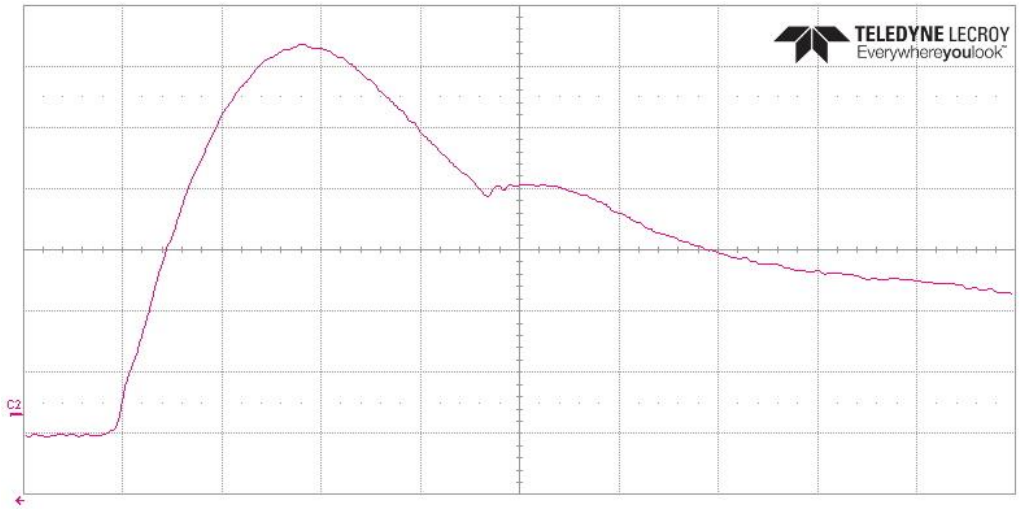
2.6. Environmental conditions

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Ambient temperature	T_{amb}	-	-25	-	+60	°C
Storage temperature	T_{store}	-	-25	-	+85	°C
Humidity	Hum	Non condensing	-	-	95	% RH
Operating altitude	Alt	-			3000	m

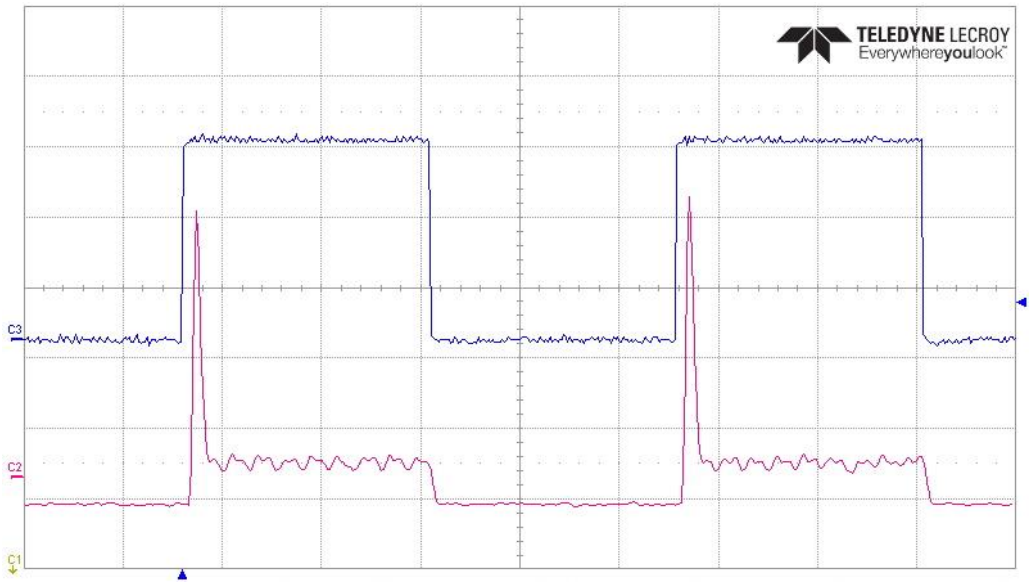
3. Function

3.1. Gate pulse

The gate pulse is made with a pulse forming network. The picture below shows the form of the curve as well as the trigger input and the resulting delay time.



Red: Gate Pulse



Red: Gate pulse
Blue: Trigger pulse

3.2. Electrical parameters gate pulse

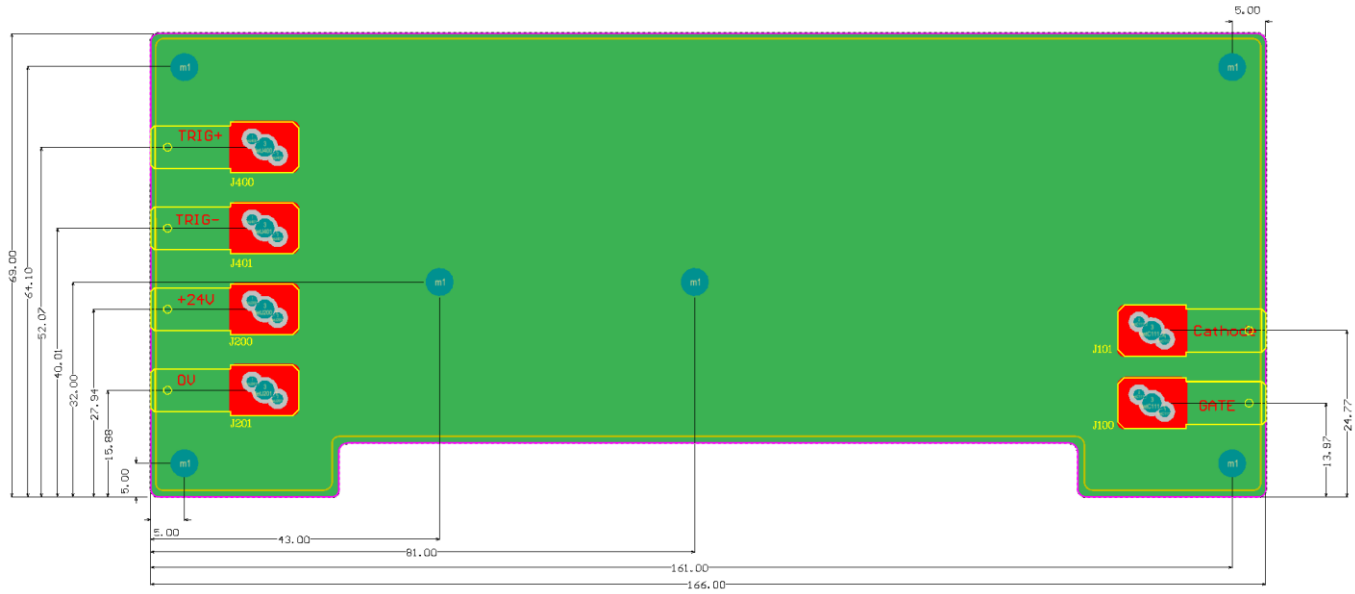
Parameter	Symbol	Condition	Min	Typ	Max	Unit
On delay time	$T_{onDelay}$	@ T_{amb} = 25°C	-	20	-	µs
Peak current	I_{peak}	@ Vin = 24V	4	6	7	A
Current rise time	d_I/d_t	@ T_{amb} = 25°C, Vin = 24V		4		A/µs
Back porch current	I_{BP}	@ T_{amb} = 25°C, Vin = 24V	0.25	0.4	0.5	A
Max Frequency	F	@ T_{amb} = 25°C, Vin = 24V		1		KHz

4. Mechanical

4.1. Parameters

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Weight	m	-		0.1		kg
Dimensions	WxDxH	-		166x69x25		mm

4.2. Mechanical Drawing



4.3. Labels

4.3.1. Front side

- Nothing

4.3.2. Rear side

- Nothing

4.3.3. Bottom side

- Type label with serial number

4.3.4. Top side

- Nothing

5. Order code

AC-10162-001 GU-SGMIII-RY-V1-01

6. Datasheets

6.1. Faston receptacles

Connection to the trigger, power and gate must be made with an 6.3mm Faston connector. Use one of them below or similar. Please check always that crimping is made with correct tools.

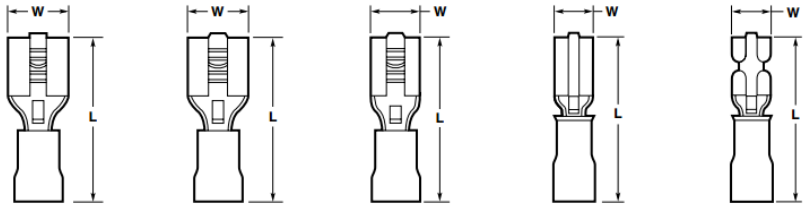
PIDG FASTON Receptacles and Tabs (Continued)

Receptacles

Receptacle Style
A — No dimple with wire stop
B — Dimple with wire stop
C — No dimple, no wire stop

Material
Insulation — Nylon
Receptacle Body — Brass per ASTM B-36 or phosphor bronze per ASTM B-139
Plating — Tin per MIL-T-10727 except where noted.
Metallic Sleeve — Copper per ASTM B-152
Plating — Tin per MIL-T-10727

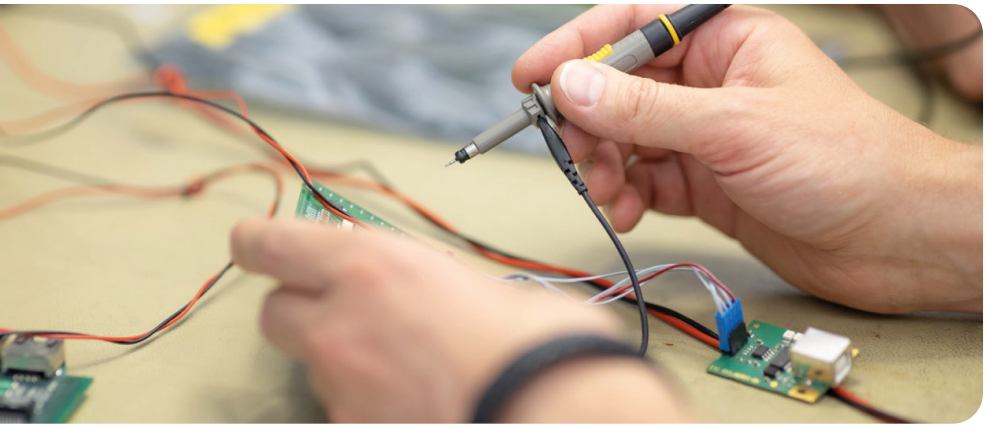
Related Product Data
Application Tooling — reference Catalog 82042 for tooling



.250 Series | **.205 Series** | **.187 Series** | **.110 Series- Standard** | **.110 Series- Low Insertion**

Series	Wire Size Circular Mils [mm²]	Style	Dimensions W Nom.	Dimensions L Max.	Terminal Insulation Color	Wire Insulation Diameter Max.	Recept. Matl.	Stock Thk.	Fits Tab Thk.	Part Numbers Loose Piece	Part Numbers Tape Mounted	Part Numbers Strip Form
.250	22-18 509-1,900 [0.26-0.96]	B	.300 7.62	.900 22.86	Red	.140 3.56	Brass	.018 0.46	.032 0.81	640903-1*	640903-2	640902-1
					Red	.140 3.56	Brass	.018 0.46	.032 0.81	55675-1[2]	55675-2[2]	—
	16-14 2,050-5,180 [1.04-2.62]	B	.300 7.62	.900 22.86	Blue	.170 4.32	Brass	.018 0.46	.032 0.81	640905-1*	640905-2	640904-1
	14-12 3,831-6,470[1] [1.94-3.28]	B	.300 7.62	1.012 25.70	Green	.250 6.35	Brass	.018 0.46	.032 0.81	42844-1*†	42844-3†	60544-3†
					Green	.250 6.35	Phos. Brz.	.018 0.46	.032 0.81	42844-2*†	—	—
	12-10 5,180-13,100 [2.62-6.64]	B	.300 7.62	1.012 25.70	Yellow	.250 6.35	Brass	.018 0.46	.032 0.81	640907-1*	640907-2	640906-1
					Yellow	.250 6.35	Phos. Brz.	.018 0.46	.032 0.81	61198-2[3]†	61198-4[4]†	61197-2

About Astrol



Technology leader in pulsed power switches and solid-state circuit breakers

Astrol is a Switzerland based innovator and manufacturer of state-of-the-art power control and switching solutions. We design and produce electronic parts for technical high demanding industries such as medical, energy distribution and pulsed power applications since 1996. In our 25-year history we have developed from a designer of custom-built electronics to a technology leader in pulsed power switches and solid-state circuit breakers with a wide range of products and a world-wide customer base consisting of operating companies and research institutes.

Our main focus lies on power switching in the medium voltage range, from optimized gate drive units to fully integrated solutions of up to 100kV. Our products are designed, manufactured and tested in our production location and high voltage test laboratory in Othmarsingen and therefore are able to withstand harsh environments, extended temperatures and have a long lifetime.

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