Pegasus Actuators GmbH

PA-RR-260-8-C-24-C-315-00 - Datasheet

revision A05

Content

General Description

Pegasus redundant servo actuators have been developed for applications that require extraordinary operating reliability. The actuator´s two channel design allows for continuous operation even after a single point failure has occurred.

Redundancy Architecture

The actuator hardware consists of the following:

Multiple master control units allow for a majority decision, 2 independent servo controllers each controlling one brushless motor and 3 contact-less position angle sensors in order to detect and rectify an incorrect output shaft position signal. During standard mode the actuator exchanges signals through both actuator channels.

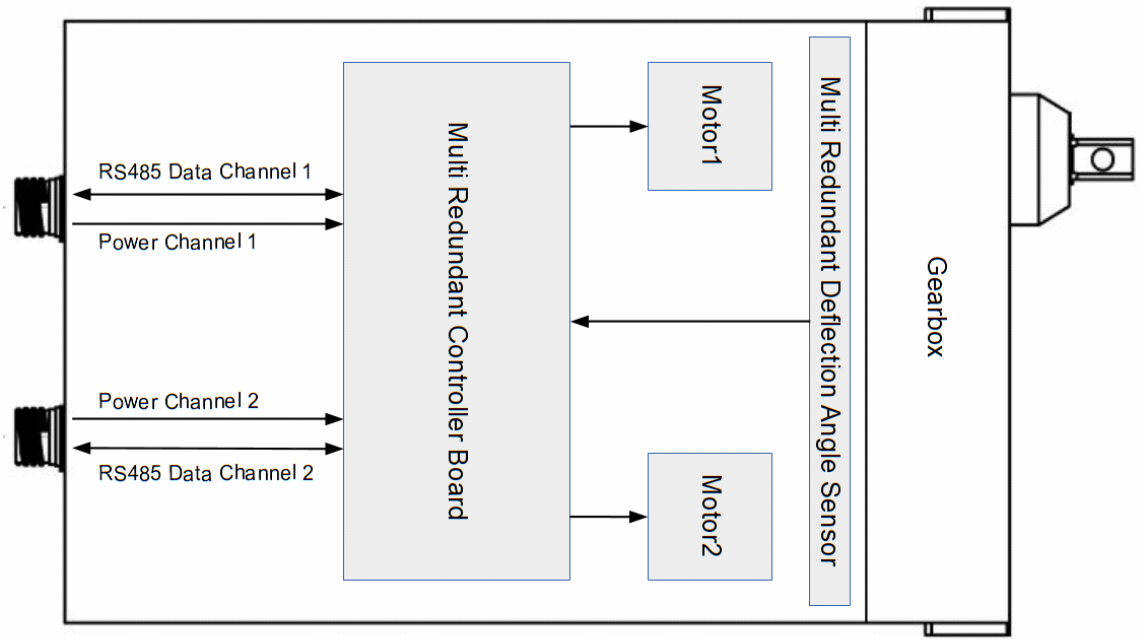
In standard mode motor no. 1 and its power stage unit are working, meaning that the motor no. 2 and its power stage unit will only be engaged after no.1 unit has failed.
The actuator performance is not negatively affected after a motor/ power stage failure.

An example for a single point failure management: in case of a defective motor, the multiple master controllers immediately recognize that the actuator did not reach the desired position. The back up motor/ servo controller unit will be switched on without requiring the assistance of the AP(Autopilot). In principle all possible single point failures are handled accordingly.

Another example: in case of a broken signal cable, the multiple master controllers will diagnose a missing or invalid signal and switch to the other channel. In case of two different but valid signals, the master-controllers will stay with the original communication channel.

Product features

Stand alone redundancy architecture with inbuild decision logic
Redundant PA-ME³ magnetic deflection angle sensor
Dual brushless motors
Dual servo controller PCB
Dual Glenair Mighty Mouse Series 801, 7-pin connector
Single Point Failure redundancy architecture
Oil lubricated gear-box
Anti flutter circuit
Enhanced positioning resolution
Inbuilt (switchable) termination resistor
Inbuilt safeguarding against Motor overcurrent
Inbuilt power supply filter
Enhanced feedback signal resolution

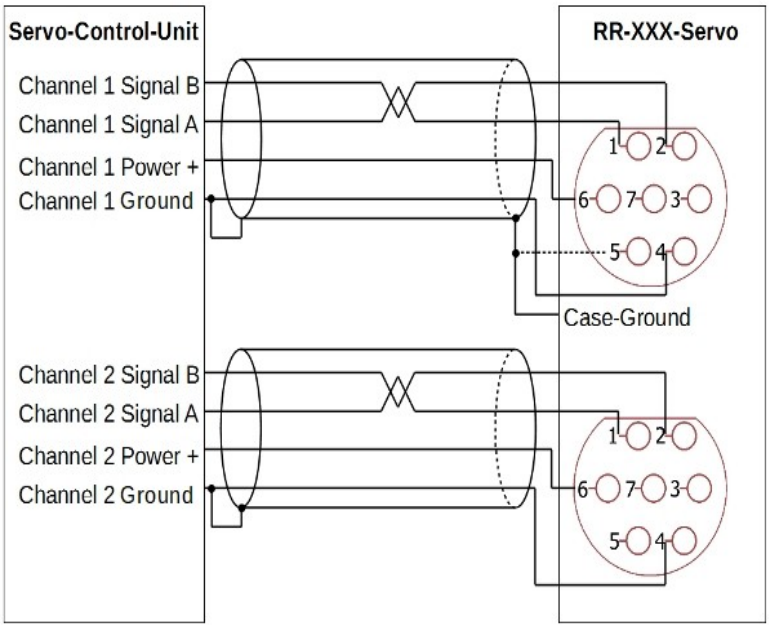


Connector

Glenair Series 801 MightyMouse: 801-011-07NF6-7PA
Mating connector: Glenair Series 801-007 or 801-008 with shell size 6-7 and Key position A

Pin Assignment

1	Signal A
2	Signal B
3	
4	Power Ground
5	
6	Power +
7	



Operating Data

Absolute Maximum Ratings

Supply Voltage: ..... -0.3V to 34V
Operating temperature: ..... -40°C - +70°C
Storage temperature: ..... -40°C - +85°C
Axial load on output shaft: .... < 100N
Lateral load on output shaft: .. < 300N

The following voltage differences must not exceed 15V:
Channel 1 Power + to Channel 2 Power +
Channel 1 Power Ground to Channel 2 Power Ground

The following voltage differences must not exceed 34V:
Channel 1 Power + to Channel 1 Power Ground
Channel 1 Power + to Channel 2 Power Ground
Channel 2 Power + to Channel 1 Power Ground
Channel 2 Power + to Channel 2 Power Ground

Electrical Characteristics

PARAMETER	MIN	TYP	MAX	UNITS
Supply Voltage	18	24	32	V
Standby current: @18V	123	165	205	mA
Standby current: @24V	97	130	162	mA
Standby current: @28V	82	110	138	mA
Standby current: @18V only one channel connected	82	110	138	mA
Standby current: @24V only one channel connected	67	90	115	mA
Standby current: @28V only one channel connected	56	75	95	mA
starting current *1	800	1000	1400	mA
Operating current *2	400	500	700	mA

*1 The servo is moved at a supply voltage of 24V, against a load of 300Ncm. The noted starting current is the average value of the first millisecond.

*2 The servo is moved at a supply voltage of 24V, against a load of 300Ncm. The noted travel current is the average value over the travel time without the acceleration and deceleration.

RS485 Interface Characteristics

PARAMETER	MIN	TYP	MAX	UNITS
Input Voltage low	-7		-0,2	V
Input Voltage high	0,2		12	V
Receiver Input Resistance	48	125		kOhm
Receiver Termination Resistance	108	120	156	Ohm
Differential Driver Output Voltage	2,1		5	V
Maximum Driver Short-Circuit Current			±250	mA
Baud-Rate	9600	115200	230400	bit/sec.

Further information on the RS485 interface (including the servo commands) can be found in our RS485 data protocol.

Product Characteristics

PARAMETER	MIN	TYP	MAX	UNITS
Weight	470 / 16,6	480 / 16,9	490 / 17,3	g / oz
Travel angle	± 0,022 *1		± 157,5	°
Rated torque *2		300 / 425		Ncm / oz-in
Stall torque	500 / 708			Ncm / oz-in
Slip clutch release momentum	500 / 708		600 / 850	Ncm / oz-in
Speed at rated torque: @24V	118	135		°/sec
No load speed: @24V	184	210		°/sec
Gear train backlash *3			0,5	°
Feedback resolution *4	0,06		0,022	°

*1 The smallest control command corresponds to an angle of 0.022 °. The smallest, actually driven angle is however larger and depends - amongst others - on the load of the servo and its parameter settings.

*2 According to specifications of Pegasus Actuators GmbH.
(please inquire the test-specifications)

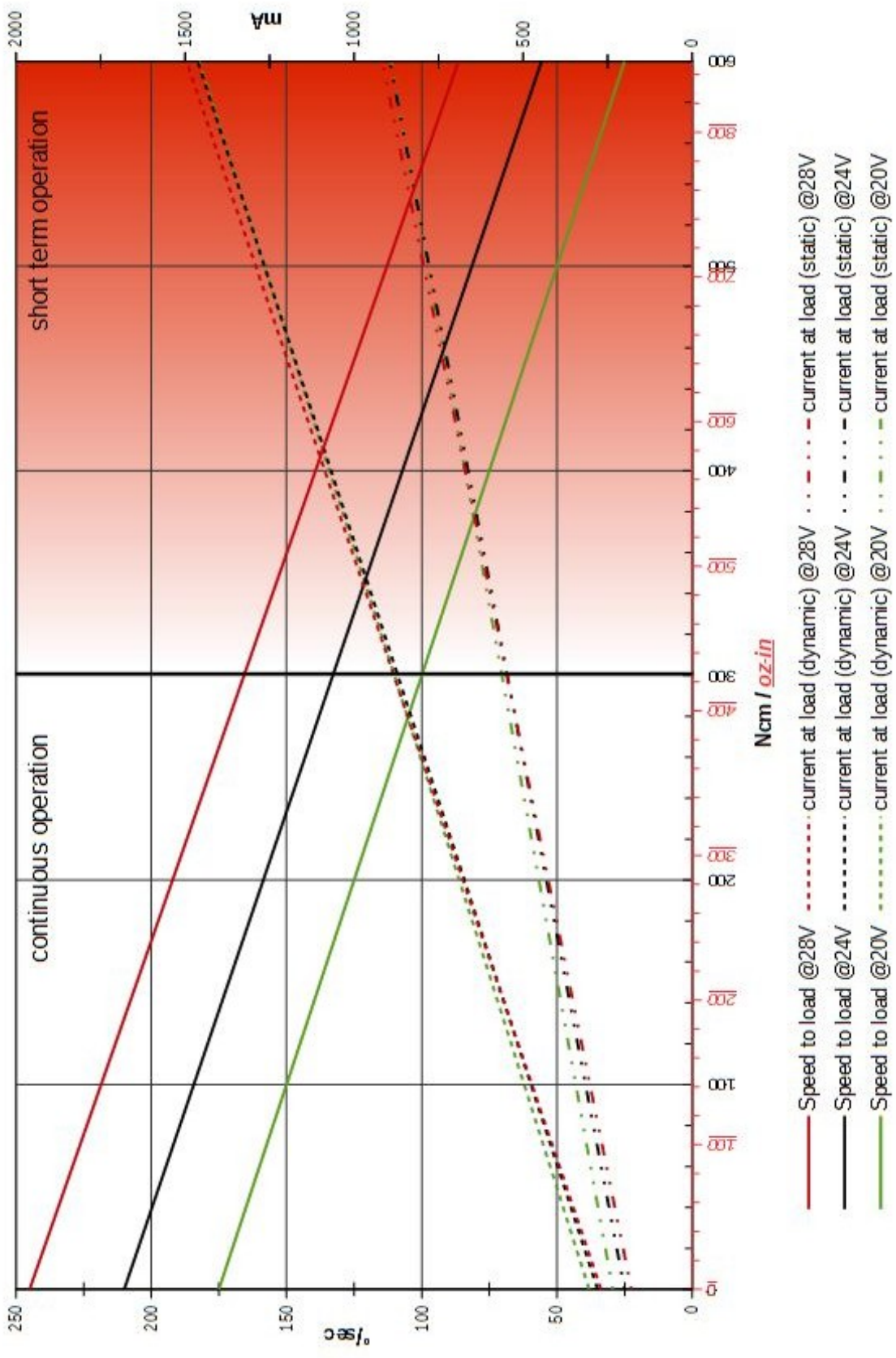
*3 Will increase during its lifetime.

*4 Due to signal noise the resolution may be reduced.

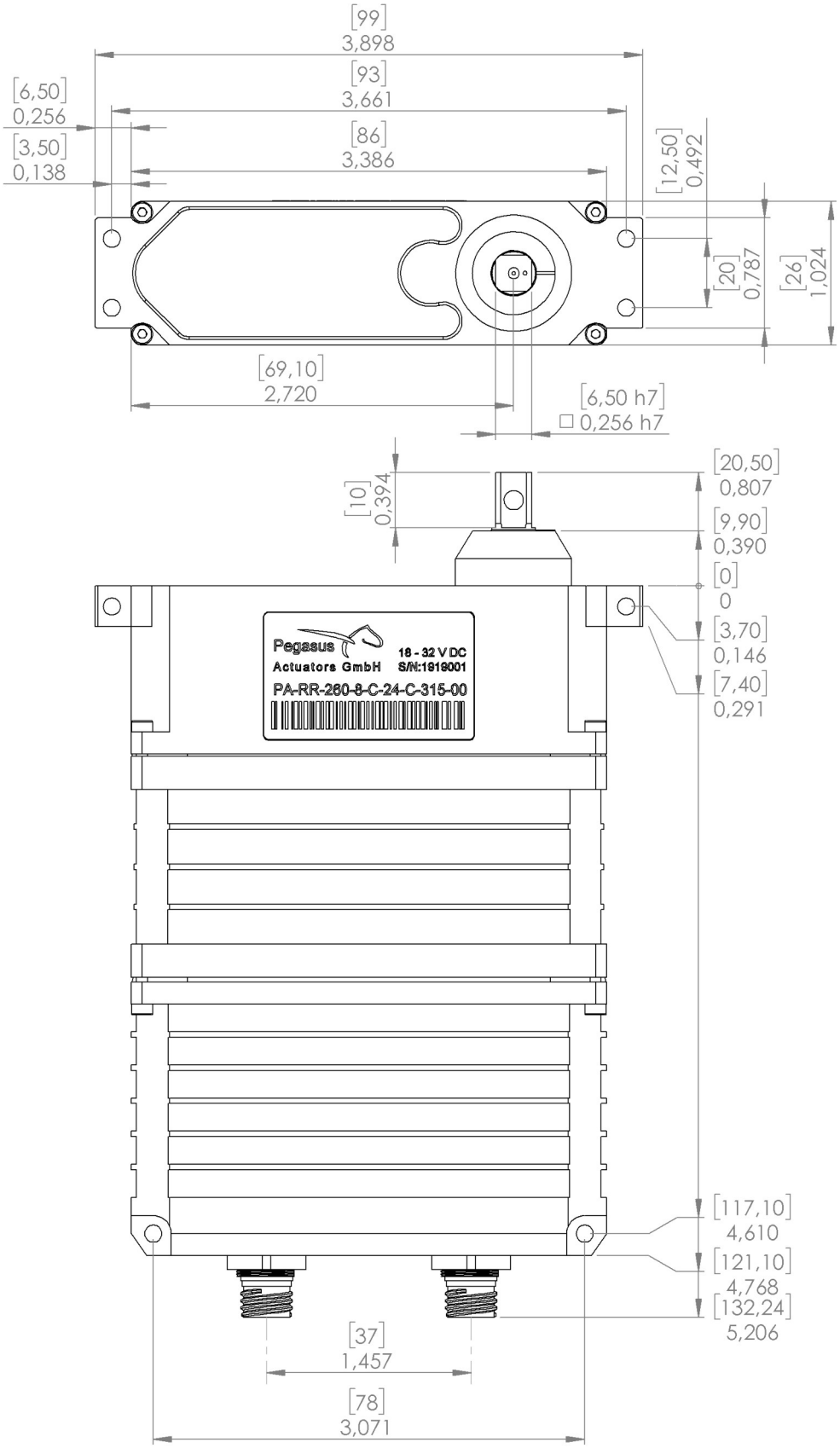
Environmental specifications

Vibration test:	Please inquire test documentation
Shock test:	Please inquire test documentation
Protection class:	IP67
Environmental Conditions:	Designed to comply with DO-160 F (RTCA), Mil STD 810

Performance Graph



Dimension - Drawing



Order Code

PA - RR - 260 - 8 - C - 24 - C - 315 - 00

Actuator type:	
RR-260	redundant/rotary/26,0mm wide
torque index:	
8	
output-shaft:	
C	Slip clutch
operating Voltage:	
24	18 to 32 VDC operating range
Signal type:	
C	Redundant RS485 data protocol
Travel angle:	
315	315° travel angle
Revision index:	
00	Glenair series 801 connector

This document is intended to be used by Pegasus Actuators GmbH customers and personnel as an aid to understand the Pegasus Actuators data protocol interface.

The interface data contained herein have been compiled from design specifications, simulation results and testing.
Due to the ongoing nature of the program, data contained herein are subject to change without notice.

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