## Data Sheet Overview

<table>
<thead>
<tr>
<th>Waveguide</th>
<th>Acuator</th>
<th>Isolation</th>
<th>Type no</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR229/R40/WG11A</td>
<td>Latching</td>
<td>80</td>
<td>WS8286A/00</td>
<td>10</td>
</tr>
<tr>
<td>WR284/R32/WG10</td>
<td>Latching</td>
<td>80</td>
<td>WS8286S/00</td>
<td>12</td>
</tr>
<tr>
<td>WR187/R48/WG12</td>
<td>Latching</td>
<td>80</td>
<td>WS8286G/00</td>
<td>14</td>
</tr>
<tr>
<td>WR112/R84/WG15</td>
<td>Latching</td>
<td>80</td>
<td>WS8086H/00</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>80</td>
<td>WS8087H/00</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>80</td>
<td>WS8186H/00</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>80</td>
<td>WS8186H/70</td>
<td>22</td>
</tr>
<tr>
<td>WR137/R70/WG14</td>
<td>Latching</td>
<td>75</td>
<td>WS8186J/00</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>75</td>
<td>WS8186J/70</td>
<td>26</td>
</tr>
<tr>
<td>WR90/R100/WG126</td>
<td>Latching</td>
<td>90</td>
<td>WS8086X/00</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>90</td>
<td>WS8087X/00</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>60</td>
<td>WS8088X/00</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8089X/00</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8189X/00</td>
<td>36</td>
</tr>
<tr>
<td>WR75/R120/WG17</td>
<td>Latching</td>
<td>90</td>
<td>WS8086M/00</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>90</td>
<td>WS8087M/00</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8089M/00</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8189M/00</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8189M/70</td>
<td>46</td>
</tr>
<tr>
<td>WR62/R140/WG18</td>
<td>Latching</td>
<td>90</td>
<td>WS8086P/00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>90</td>
<td>WS8087P/00</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Fail-safe</td>
<td>60</td>
<td>WS8088P/00</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8089P/00</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8189P/00</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Latching</td>
<td>60</td>
<td>WS8189P/70</td>
<td>58</td>
</tr>
<tr>
<td>WR42/R220/WG20</td>
<td>Latching</td>
<td>70</td>
<td>WS8189K/00</td>
<td>60</td>
</tr>
<tr>
<td>WR28/R320/WG22</td>
<td>Latching</td>
<td>60</td>
<td>WS8089Q/00</td>
<td>61</td>
</tr>
<tr>
<td>WRD580</td>
<td>Latching</td>
<td>50</td>
<td>WS8189D58/00</td>
<td>64</td>
</tr>
<tr>
<td>WRD650</td>
<td>Latching</td>
<td>50</td>
<td>WS8089D6/00</td>
<td>66</td>
</tr>
<tr>
<td>WRD750</td>
<td>Latching</td>
<td>40</td>
<td>WS8089D7/00</td>
<td>68</td>
</tr>
</tbody>
</table>

See also Sivers Standard Flange dimensions 70
Waveguide Switches

General

This catalogue describes the design of standard manual and automatic waveguide switches. Switches are available in frequencies ranging from 2.6 to 40 GHz.

Other models and special designs are available on request.

Waveguide switches are widely used in microwave systems:
- In radars for redundancy transmitters
- In radars for connection to high power dummy load
- In radars for test purposes
- In satellite communications for redundancy applications
- In test systems to select various signal paths etc.

Common to all Sivers Lab mechanical waveguide switches are:
- High isolation
- Low insertion loss
- High power capability
- Long life
General Design

The switches have a square stator with four waveguide ports. The rotor, which is fitted in the stator, has two or three channels. Electrical continuity between rotor and stator is achieved by means of quarter wave chokes. These chokes give extremely high isolation between the channels and also ensure unchanged high electrical performance throughout the lifetime of the switch.

All models have low VSWR and high power handling capacity. They withstand the full power rating of the waveguide and most models can be pressurised to 0.2 MPa (2 ATO) for high peak power applications.

All switches have E-plane bends for small dimensions.

The switches are made of copper-free aluminium alloy, which is chromated. The rotor is supported by stainless steel ball bearings.

The flange connections are, for most models, standard flat flanges with threaded holes. Special flange drilling and/or helicoil steel inserts are available on request.

Switches are available with:
• standard rectangular waveguides
• double-ridge waveguides
Configuration

All switches have a square stator with four ports. The rotor has two channels.

Four ports – two channels (transfer).

Actuators

Manual and automatic (electromagnetic) actuators are available.

The automatic types are fail-safe or latching. The fail-safe type returns to the de-energized position when the power is disconnected and requires a small holding current in the energized position. The latching type is stable in both positions without holding current.

In applications like safety-circuits, where it is required that the switch returns to its original position, if power supply fails, a fail-safe type is the natural choice. In other applications it might be an advantage to have low power consumption and no holding current.

Several models of automatic actuators are available for switches in the frequency range 4 to 40 GHz. All standard models operate at 28 Volts and have a maximum switch current of 1 Ampere and a maximum holding current of 0.3 Ampere.

For all latching models the current is automatically switched off when the rotor is in position. In fail-safe models the current is automatically reduced to holding current when the rotor is in position.

One or several sets of position indicators are available with all models of actuators.

Some models can be supplied with manual override knob for manual setting of position.

Standard Model. Type number 80--. These models have the smallest dimensions. They have one set of position indicators and the electrical connection is via soldering pins or circular MIL-connector. Switch time is 100 to 250 ms (depending on frequency band). The models are in most cases specified for full temperature range.

SatCom Model. Type number 81--. This model can be supplied with up to four sets of position indicators. One set of indicators can be arranged to have “inhibit” function, which is a closed contact at end positions and an open contact during transition. The actuator has manual override and cannot be pressurized. Switch time is 100 to 150 ms. The electrical connection is via a circular MIL-connector.
**Technical Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSWR</td>
<td>1.05 to 1.08 for rectangular waveguides and 1.20 for double ridge models.</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>&lt; 0.1 dB power capacity, except for double ridge models, which have 0.2 to 0.4 dB. See datasheets for each model.</td>
</tr>
<tr>
<td>Flanges</td>
<td>MIL-F-3299 for rectangular waveguides and MIL-F-39000 for double ridge waveguides.</td>
</tr>
<tr>
<td>Actuator voltage</td>
<td>28±3 V DC as standard. Some models may have a different voltage.</td>
</tr>
<tr>
<td>Actuator current</td>
<td>1 A for standard models.</td>
</tr>
<tr>
<td>Switch time</td>
<td>100 to 1000 ms depending on model.</td>
</tr>
<tr>
<td>Position indicators</td>
<td>60 V/500 mA rating.</td>
</tr>
<tr>
<td>Connectors</td>
<td>Soldering pins, flying lead or circular MIL connector according to datasheet.</td>
</tr>
<tr>
<td>Pressurization</td>
<td>Max. 0.2 MPa (not for 81- models).</td>
</tr>
<tr>
<td>Leakage</td>
<td>Max. 10 cc/minute.</td>
</tr>
<tr>
<td>Material</td>
<td>Stator and rotor; aluminium alloy copper free.</td>
</tr>
<tr>
<td>Finish</td>
<td>Stator and rotor; Chromate per MIL-C-5541C.</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations minimum.</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 to +85°C operating except 81- models which have 0 to 50°C.</td>
</tr>
<tr>
<td>Vibration</td>
<td>10 G for standard models. Up to 30 G for special models.</td>
</tr>
<tr>
<td>Duty</td>
<td>2 actuations/second at temperatures up to +40°C decreasing to one actuation/2 seconds at +85°C.</td>
</tr>
<tr>
<td>Reliability</td>
<td>All switches are actuated and the function monitored for 1 000 actuations at room temperature, highest and lowest specified temperature.</td>
</tr>
</tbody>
</table>
The Company

Sivers is a long-established European microwave product manufacturer located in Sweden's largest high-tech area, Kista, in the northern part of Stockholm. Carl von Sivers founded the company in 1951. With more than 50 years experience in microwaves, Sivers is a world-leading manufacturer of Waveguide Switches. The 2 000 sq. meters (20 000 sq. feet) facilities contain state-of-art technologies and equipment for development, engineering and production. These facilities allow the necessary activities in-house with short lead times and full quality control providing both standard and customised products.

Development and production are supported by CAD/CAM systems with highly automated production equipment for low as well as large quantity production. All activities are guided by a Quality System that complies with ISO-9001:2000.

In addition to common microwave and mechanical test equipment Sivers has also equipment for high power tests, random vibration, burn-in, temperature cycling, low noise measurements etc.

Sivers forms a part of the Chelton Group, a division of Cobham Plc. Cobham Plc is a substantial British industrial group with companies in Europe and North America, employing over 8 900 people and with a turnover of 832 million GBP (2003). Cobham is internationally known as a key supplier to aeronautical and defence industries, particularly in the field of RF and micro-wave.

The capabilities of the group, particularly the very close co-operation with the leading slipring manufacturer Air Precision, allow Sivers to further improve its commercial technical performance and thus offer you an even better service.

Quality

Sivers is fully certified as per ISO-9001:2000 and quality remains one of Sivers' main priorities. With its qualified engineers and sophisticated test equipment Sivers constantly seeks to maintain and improve the quality of products by application of ISO 9001:2000 procedures and instructions. The Quality Assurance Department is completely involved in all stages of the design, development and manufacturing of our products. Each product delivered can be accompanied by an individual test document. Our Quality Manager certifies the quality by a Certificate of Conformance.
Specifications
CAUTION!
ESD SENSITIVE

Opened during VSWR >1.2

4x M6
Depth min 6
Φ 0.2

MANUAL OVERRIDE

RF DATA
Frequency range 3.3 – 4.9 GHz
VSWR 1.05
Insertion loss 0.1 dB
Isolation 80 dB
Peak power 500 kW at 0.1 MPa abs., +25°C
Average power 4 kW
Flange interface MIL-DTL-3922/52C-012

ACTUATOR DATA
Operating voltage 28 ± 3 VDC
Operating current 1 A
Switching time 200 ms
Duty (min time between 500 ms -20°C to +40°C successive operations) linearly increasing to 1 s at +85°C
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR
Position indicator current 30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 2 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature -20°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g

This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party.
**RF DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>3.3 – 4.9 GHz</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.05</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>80 dB</td>
</tr>
<tr>
<td>Peak power</td>
<td>500 kW at 0.1 MPa abs., +25°C</td>
</tr>
<tr>
<td>Average power</td>
<td>4 kW</td>
</tr>
<tr>
<td>Flange interface</td>
<td>MIL-DTL-3922/52C-012</td>
</tr>
<tr>
<td></td>
<td>Modified with M6, thread depth min 8</td>
</tr>
</tbody>
</table>

**ACTUATOR DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>28±3 VDC</td>
</tr>
<tr>
<td>Operating current</td>
<td>1 A</td>
</tr>
<tr>
<td>Switching time</td>
<td>200 ms</td>
</tr>
<tr>
<td>Duty (min time between successive operations)</td>
<td>500 ms -20°C to +40°C linearly increasing to 1 s at +85°C</td>
</tr>
<tr>
<td>Connector</td>
<td>MS 3112E 14-19P</td>
</tr>
<tr>
<td>Mating connector</td>
<td>MS 3116F 14-19S or eq.</td>
</tr>
</tbody>
</table>

**POSITION INDICATOR**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position indicator current</td>
<td>30 V Max, 100 mA Max Resistive load</td>
</tr>
<tr>
<td>Position indicator</td>
<td>Three sets of C-form contacts and one set of inhibit contact, opened during VSWR &gt;1.2</td>
</tr>
</tbody>
</table>

**MECHANICAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Aluminium alloy, Cu free</td>
</tr>
<tr>
<td>Finishing</td>
<td>Chromate per MIL-C-5541 and black painted</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.1 MPa overpr. Max</td>
</tr>
<tr>
<td>Air leakage</td>
<td>10 cm³/min (0.1 MPa overpr.) Max</td>
</tr>
<tr>
<td>Weight</td>
<td>2 kg Max</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20°C to +85°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>5 – 18 Hz, 3 mm amplitude</td>
</tr>
<tr>
<td></td>
<td>18 – 2000 Hz, 15 g</td>
</tr>
</tbody>
</table>
**CAUTION!**
ESD SENSITIVE

**Dimensions in mm**

- **Ctrl. circ.**
- **Depth min 6**
- **4x M6**
- **20 MAX**
- **107,95**
- **63,5**
- **130**
- **210 MAX**
- **80**
- **80**
- **80**

**Title**
WAVEGUIDE SWITCH
WR284/R32/WG10 Latching

**Ref.**
2003-1113

**Chkd.**
HNg

**Dimensions**

- **Europ. proj.**
- **SS 1902**
- **ISO 8015**

**General tolerances, linear and angular dimensions:**
ISO 2768-c

**WAVEGUIDE SWITCH**

**WS8286S/00**

---

This document is our property and shall not without our written permission be altered, copied or communicated to a third party.

© Sivers Lab AB, Sweden
**RF DATA**

Frequency range: 2.6 – 3.95 GHz  
VSWR: 1.05  
Insertion loss: 0.1 dB  
Isolation: 80 dB  
Peak power: 1 MW at 0.1 MPa abs., +25°C  
Average power: 8 kW  
Flange interface: MIL-DTL-3922/52C-032
Modified with M6, thread depth min 8

**ACTUATOR DATA**

Operating voltage: 28±3 V DC  
Operating current: 1 A, Self cut off  
Switching time: 200 ms  
Duty (min time between successive operations): 500 ms -20°C to +40°C linearly increasing to 2 s at +70°C  
Connector: MS 3112E 10-6P  
Mating connector: MS 3116F 10-6S or eq.

**POSITION INDICATOR**

Voltage / Current: 30 V Max, 100 mA Max Resistive load

**MECHANICAL DATA**

Material: Aluminium alloy, Cu free  
Finish: Chromate per MIL-C-5541 and black painted  
Air pressure: 0.1 MPa overpr. Max  
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max  
Weight: 2.5 kg Max  
Life: 250 000 actuations

**ENVIRONMENTAL DATA**

Ambient temperature: -20°C to +70°C  
Vibration: 5 – 18 Hz, 3 mm amplitude  
18 – 2000 Hz, 15 g  
Humidity: 100%RH if dry air in waveguide

---

**WS 8286S/00**
EUROPO. proj.

**CAUTION!**

ESD SENSITIVE

**DRAWING**

**SIVERS**

WR187/R48/WG12 Latching

---

**GENERAL TOPOLOGIES**

**DRAWING PRINCIPLE**

SS 1902

**TOLERANCING PRINCIPLE**

ISO 8015

**DIMENSIONS IN MM**

**Ref.** 030630  **Sign.** SKm

**Chkd.**  **Sign.** HW

**Designed**  **Sheet** 111

**Scale** 1:1.5  **Issue** B

**Doc. no.** WS8286G/00

---

**RF DATA**

Frequency range 3.95 – 5.85 GHz

VSWR 1.05

Insertion loss 0.1 dB

Isolation 80 dB

Peak power 500 kW at 0.1 MPa abs., +25° C

Average power 4 kW

Flange interface MIL-DTL-3922/52C-014

Modified with M6, thread depth min 8

---

**ACTUATOR DATA**

Operating voltage 28 ± 3 V DC

Operating current 1 A, Self cut off

Switching time 500 ms

Duty (min time between 500 ms -20° C to +40° C successive operations) linearly increasing to 2 s at +70° C

Connector MS 3112E 10-6P

Mating connector MS 3116F 10-6S or eq.

---

**POSITION INDICATOR**

Voltage / Current 30 V Max, 100 mA Max Resistive load

---

**MECHANICAL DATA**

Material Aluminium alloy, Cu free

Finishing Chromate per MIL-C-5541 and black painted

Air pressure 0.1 MPa overpr. Max

Air leakage 10 cm³/min (0.1 MPa overpr.) Max

Weight 1.5 kg Max

Life 250,000 actuations

---

**ENVIRONMENTAL DATA**

Ambient temperature -20° C to +70° C

Vibration 5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity 100%RH if dry air in waveguide

---

**REFERENCE**

Approved Origin date Issue date

HNg HW 2003-06-30 2003-11-04 B 2 (2)
RF DATA

Frequency range: 3.95 – 5.85 GHz
VSWR: 1.05
Insertion loss: 0.1 dB
Isolation: 80 dB
Peak power: 500 kW at 0.1 MPa abs., +25°C
Average power: 4 kW
Flange interface: MIL-DTL-3922/52C-014
Modified with M6, thread depth min 8

ACTUATOR DATA

Operating voltage: 28±3 V DC
Operating current: 1 A, Self cut off
Switching time: 500 ms
Duty (min time between successive operations): linearly increasing to 2 s at +70°C
Connector: MS 3112E 10-6P
Mating connector: MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current: 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material: Aluminium alloy, Cu free
Finishing: Chromate per MIL-C-5541 and black painted
Air pressure: 0.1 MPa overpr. Max
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
Weight: 1.5 kg Max
Life: 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature: -20°C to +70°C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide

WS 8286G/00
CAUTION!
ESD SENSITIVE

Dimensions in mm

- 43
- 57,15
- 25,5
- 74
- 94,6
- 74
- 43

NAME LABEL

Top view

A  Pos I
B  Com
C  Pos II
D  Pos
E  Ind.
F

Shown in Pos I (A actuated)

CAUTION!
ESD SENSITIVE
RF DATA

Frequency range 7.05 – 10.0 GHz
VSWR 1.10
Insertion loss 0.1 dB
Isolation 80 dB
Peak power 350 kW at 0.1 MPa abs., +25°C
Average power 4 kW
Flange interface MIL-DTL-3922/53D-004
Modified with M4, thread depth min 5

ACTUATOR DATA

Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 300 ms
Duty (min time between successive operations) linearly increasing to 2 s at +85°C
Connector MS 3112E 10-6P
Mating connector MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.5 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -40°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

Title
WAVEGUIDE SWITCH
WR112/R84/WS15  Fail-safe

Dimensions in mm

CAUTION!
ESD SENSITIVE

Part No.
C
D
E

NAME LABEL

Elect. circ.

shown in de-energized position

Drawing principle
SS 1902

Tolerancing principle
ISO 8015

Material
Aluminium alloy, Cu free

Finishing
Chromate per MIL-C-5541 and black painted

Air pressure
0.1 MPa overpr. Max

Air leakage
10 cm³/min (0.1 MPa overpr.) Max

Weight
0.5 kg Max

Life
250,000 actuations

Ambient temperature
-40 °C to +85 °C

Vibration
5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity
100%RH if dry air in waveguide

VRF DATA

Frequency range 7.05 – 10.0 GHz

VSWR 1.10

Insertion loss 0.1 dB

Isolation 80 dB

Peak power 350 kW at 0.1 MPa abs., +25 °C

Average power 4 kW

Flange interface MIL-DTL-3922/53D-004

Modified with M4, thread depth min 5

ACTUATOR DATA

Operating voltage 28 ± 3 V DC

Operating current 1 A, Auto switch on to holding current after 200 ms

Holding current 300 mA

Switching time 300 ms

Duty (min time between 500 ms -40 °C to +40 °C successive operations) linearly increasing to 2 s at +85 °C

Connector MS 3112E 10-6P

Mating connector MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material
Aluminium alloy, Cu free

Finishing
Chromate per MIL-C-5541 and black painted

Air pressure
0.1 MPa overpr. Max

Air leakage
10 cm³/min (0.1 MPa overpr.) Max

Weight
0.5 kg Max

Life
250,000 actuations

ENVIRONMENTAL DATA

Ambient temperature
-40 °C to +85 °C

Vibration
5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity
100%RH if dry air in waveguide
**RF DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>7.05 – 10.0 GHz</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.10</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>80 dB</td>
</tr>
<tr>
<td>Peak power</td>
<td>350 kW at 0.1 MPa abs., +25°C</td>
</tr>
<tr>
<td>Average power</td>
<td>4 kW</td>
</tr>
<tr>
<td>Flange interface</td>
<td>MIL-DTL-3922/53D-004, modified with M4, thread depth min 5</td>
</tr>
</tbody>
</table>

**ACTUATOR DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>28±3 V DC</td>
</tr>
<tr>
<td>Operating current</td>
<td>1 A, Auto switch on to holding current after 200 ms</td>
</tr>
<tr>
<td>Holding current</td>
<td>300 mA</td>
</tr>
<tr>
<td>Switching time</td>
<td>300 ms</td>
</tr>
<tr>
<td>Duty (min time between successive operations)</td>
<td>linearly increasing to 2 s at +85°C</td>
</tr>
<tr>
<td>Connector</td>
<td>MS 3112E 10-6P</td>
</tr>
<tr>
<td>Mating connector</td>
<td>MS 3116F 10-6S or eq.</td>
</tr>
</tbody>
</table>

**POSITION INDICATOR**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage / Current</td>
<td>30 V Max, 100 mA Max Resistive load</td>
</tr>
</tbody>
</table>

**MECHANICAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Aluminium alloy, Cu free</td>
</tr>
<tr>
<td>Finishing</td>
<td>Chromate per MIL-C-5541 and black painted</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.1 MPa overpr. Max</td>
</tr>
<tr>
<td>Air leakage</td>
<td>10 cm³/min (0.1 MPa overpr.) Max</td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg Max</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>5 – 18 Hz, 3 mm amplitude</td>
</tr>
<tr>
<td></td>
<td>18 – 2000 Hz, 15 g</td>
</tr>
<tr>
<td>Humidity</td>
<td>100%RH if dry air in waveguide</td>
</tr>
</tbody>
</table>

**WS 8087H/00**
### General Tolerances

- Linear and Angular Dimensions: ISO 2768-c

### Drawing Principle
- SS 1902

### Tolerancing Principle
- ISO 8015

### Dimensions in mm

- Title: WAVEGUIDE SWITCH
- Description: WR112R84/WG15 Latching

### Mechanical Data
- Material: Aluminium alloy, Cu free
- Finishing: Chromate per MIL-C-5541 and black painted
- Air pressure: 0.1 MPa overpr. Max
- Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
- Weight: 0.7 kg Max
- Life: 250 000 actuations

### Environmental Data
- Ambient temperature: -20 °C to +70 °C
- Vibration: 5 – 18 Hz, 3 mm amplitude
- 18 – 2000 Hz, 15 g
-Humidity: 100%RH if dry air in waveguide

### Actuator Data
- Operating voltage: 28 ± 3 V DC
- Operating current: 1 A, Self cut off
- Switching time: 250 ms
- Duty (min time between 500 ms -20 °C to +40 °C successive operations) linearly increasing to 2 s at +70 °C

### Connector
- MS 3112E 14-19P
- Mating connector: MS 3116F 14-19S or eq.

### Position Indicator
- Voltage / Current: 30 V Max, 100 mA Max Resistive load
- Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

### Control Circuits
- Opened during VSWR >1.2

### Manual Override

---

**CAUTION!**

- ESD SENSITIVE

---

**This document is our property and shall not without our written permission be altered, copied or communicated to a third party.**
RF DATA

Frequency range  7.05 – 10.0 GHz
VSWR  1.10
Insertion loss  0.1 dB
Isolation  80 dB
Peak power  350 kW at 0.1 MPa abs., +25°C
Average power  4 kW
Flange interface  MIL-DTL-3922/53D-004
Modified with M4, thread depth min 5

ACTUATOR DATA

Operating voltage  28±3 V DC
Operating current  1 A, Self cut off
Switching time  250 ms
Duty (min time between successive operations)  500 ms -20°C to +40°C linearly increasing to 2 s at +70°C
Connector  MS 3112E 14-19P
Mating connector  MS 3116F 14-19S or eq.

POSITION INDICATOR

Voltage / Current  30 V Max, 100 mA Max Resistive load
Position indicator  Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA

Material  Aluminium alloy, Cu free
Finishing  Chromate per MIL-C-5541 and black painted
Air pressure  0.1 MPa overpr. Max
Air leakage  10 cm³/min (0.1 MPa overpr.) Max
Weight  0.7 kg Max
Life  250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature  -20°C to +70°C
Vibration  5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity  100%RH if dry air in waveguide
RF DATA
Waveguide
Frequency range  7.05 – 10.0 GHz
VSWR   1.1
Insertion loss  0.1 dB
Isolation   75 dB
Peak power   350 kW at 0.1 MPa abs., +25 °C
Average power  4 kW
Flange interface  MIL-DTL-3922/53D-004
Modified with 10 – 32 UNC-2B, thread depth min 8
Coax
Frequency range  7.05 – 10.0 GHz
VSWR   1.3
Insertion loss  0.5 dB
Isolation   60 dB
Peak power   5 kW
Average power  15 W max
Coax connector  SMA-female
Isolation, waveguide-coax 120 dB

ACTUATOR DATA
Operating voltage  28 ± 3 V DC
Operating current  1 A, Self cut off
Switching time  250 ms
Connector   MS 3112E 14-19P
Mating connector  MS 3116F 14-19S or eq.

POSITION INDICATOR
Voltage / Current  30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material   Aluminium alloy; Cu-free
Finishing   Chromate per MIL-C-5541
Air pressure   0.1 MPa overpr. Max
Air leakage   10 cm³/min (0.1 MPa overpr.) Max
Weight   0.7 kg Max
Life   250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature  -20 °C to +70 °C
Vibration   5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity   100%RH if dry air in waveguide

CAUTION!
ESD SENSITIVE

Drawing principle  SS 1902
Tolerancing principle  ISO 8015
Dimensions in mm
RF DATA

Waveguide
Frequency range 7.05 – 10.0 GHz
VSWR 1.1
Insertion loss 0.1 dB
Isolation 75 dB
Peak power 350 kW at 0.1 MPa abs., +25°C
Average power 4 kW
Flange interface MIL-DTL-3922/53D-004
Modified with 10 – 32 UNC-2B, thread depth min 8

Coax
Frequency range 7.05 – 10.0 GHz
VSWR 1.3
Insertion loss 0.5 dB
Isolation 60 dB
Peak power 5 kW
Average power 15 W max
Coax connector SMA-female
Isolation, waveguide-coax 120 dB

ACTUATOR DATA

Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 250 ms
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA

Material Aluminium alloy; Cu-free
Finishing Chromate per MIL-C-5541
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.7 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -20°C to +70°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

Dimensions in mm

Title
WAVEGUIDE SWITCH
WR137/R70/WG14  Latching

Drawing principle
SS 1902

Tolerancing principle
ISO 8015

CAUTION!
ESD SENSITIVE
RF DATA

Frequency range 5.85 – 8.2 GHz
VSWR 1.1
Insertion loss 0.1 dB
Isolation 75 dB
Peak power 350 kW at 0.1 MPa abs., +25°C
Average power 4 kW
Flange interface MIL-DTL-3922/52C-040
Modified with 10-32 UNF, thread depth min 8

ACTUATOR DATA

Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 250 ms
Duty (min time between successive operations) 500 ms -20°C to +40°C linearly increasing to 2 s at +70°C
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.7 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -20°C to +70°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
**Title:** WAVEGUIDE SWITCH  
WR137/R70/WG14  
Latching with COAX DPDT

**Drawing Principle:** SS 1902  
**Tolerancing Principle:** ISO 8015

**Dimensions in mm:**

- Flange for attaching coax twisted 45°  
- Depth min 5
- 4x M4

**Notes:**

- **CAUTION!** ESD SENSITIVE
- **INHIBIT**
- Opened during VSWR >1.2
- Shown in Pos I (A actuated)

**Specifications:**

- **Frequency range:** 5.85 – 8.2 GHz
- **VSWR:** 1.1
- **Insertion loss:** 0.1 dB
- **Isolation:** 75 dB
- **Peak power:** 350 kW at 0.1 MPa abs., +25°C
- **Average power:** 4 kW
- **Flange interface:** MIL-DTL-3922/52C-040

- **Frequency range:** 5.85 – 8.2 GHz
- **VSWR:** 1.3
- **Insertion loss:** 0.5 dB
- **Isolation:** 60 dB
- **Peak power:** 5 kW
- **Average power:** 15 W max
- **Coax connector:** SMA-female
- **Isolation, waveguide-coax:** 120 dB

**Actuator Data:**

- **Operating voltage:** 28 ± 3 V DC
- **Operating current:** 1 A, Self cut off
- **Switching time:** 250 ms
- **Connector:** MS 3112E 14-19P
- **Mating connector:** MS 3116F 14-19S or eq.

**Position Indicator:**

- **Voltage / Current:** 30 V Max, 100 mA Max Resistive load
- **Position indicator:** Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

**Mechanical Data:**

- **Material:** Aluminium alloy; Cu-free
- **Finishing:** Chromate per MIL-C-5541
- **Air pressure:** 0.1 MPa overpr. Max
- **Air leakage:** 10 cm³/min (0.1 MPa overpr.) Max
- **Weight:** 0.7 kg Max
- **Life:** 250 000 actuations

**Environmental Data:**

- **Ambient temperature:** -20°C to +70°C
- **Vibration:** 5 – 18 Hz, 3 mm amplitude
- **18 – 2000 Hz, 15 g**
- **Humidity:** 100%RH if dry air in waveguide

**Ref.:** 021114  
**Sign.:** CEL

**Chkd.:** HW

**Sign.:** HW

**Designed:**  
**Apprved.:**

**Scale:** 1:1.5  
**Issue:** D

**Doc. no.:** WS8186J/70

---

This document is our property and shall not without our written permission be altered, copied or communicated to a third party. © Sivers Lab AB, Sweden
RF DATA

Waveguide
Frequency range: 5.85 – 8.2 GHz
VSWR: 1.1
Insertion loss: 0.1 dB
Isolation: 75 dB
Peak power: 350 kW at 0.1 MPa abs., +25°C
Average power: 4 kW
Flange interface: MIL-DTL-3922/52C-040
Modified with 10 – 32 UNF-2B, thread depth min 8

Coax
Frequency range: 5.85 – 8.2 GHz
VSWR: 1.3
Insertion loss: 0.5 dB
Isolation: 60 dB
Peak power: 5 kW
Average power: 15 W max
Coax connector: SMA-female
Isolation, waveguide-coax: 120 dB

ACTUATOR DATA
Operating voltage: 28±3 V DC
Operating current: 1 A, Self cut off
Switching time: 250 ms
Connector: MS 3112E 14-19P
Mating connector: MS 3116F 14-19S or eq.

POSITION INDICATOR
Voltage / Current: 30 V Max, 100 mA Max Resistive load
Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material: Aluminium alloy; Cu-free
Finishing: Chromate per MIL-C-5541
Air pressure: 0.1 MPa overpr. Max
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
Weight: 0.7 kg Max
Life: 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature: -20°C to +70°C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide

WS 8186J/70
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

Title: WAVEGUIDE SWITCH

Dimensions in mm:

 referencialed

Material: Aluminium alloy, Cu free

Finishing: Chromate per MIL-C-5541 and black painted

Air pressure: 0.1 MPa overpr. Max

Air leakage: 10 cm³/min (0.1 MPa overpr.) Max

Weight: 0.5 kg Max

Life: 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature: -40 °C to +85 °C

Vibration: 5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity: 100%RH if dry air in waveguide

This document is our property and shall not without our written permission be altered, copied or communicated to a third party.

ESD SENSITIVE

CAUTION!
### RF DATA

- **Frequency range**: 8.2 – 12.4 GHz
- **VSWR**: 1.08
- **Insertion loss**: 0.1 dB
- **Isolation**: 90 dB
- **Peak power**: 250 kW at 0.1 MPa abs., +25°C
- **Average power**: 3 kW
- **Flange interface**: MIL-DTL-3922/53D-016 modified with M4, thread depth min 5

### ACTUATOR DATA

- **Operating voltage**: 28±3 V DC
- **Operating current**: 1 A
- **Switching time**: 300 ms, Self cut off
- **Duty (min time between successive operations)**: linearly increasing to 2 s at +85°C
- **Connector**: MS 3112E 10-6P
- **Mating connector**: MS 3116F 10-6S or eq.

### POSITION INDICATOR

- **Voltage / Current**: 30 V Max, 100 mA Max Resistive load

### MECHANICAL DATA

- **Material**: Aluminium alloy, Cu free
- **Finishing**: Chromate per MIL-C-5541 and black painted
- **Air pressure**: 0.1 MPa overpr. Max
- **Air leakage**: 10 cm³/min (0.1 MPa overpr.) Max
- **Weight**: 0.5 kg Max
- **Life**: 250 000 actuations

### ENVIRONMENTAL DATA

- **Ambient temperature**: -40°C to +85°C
- **Vibration**: 5 – 18 Hz, 3 mm amplitude
- **Humidity**: 100%RH if dry air in waveguide
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

- General tolerances, linear and angular dimensions: ISO 2768-c
- Europ. proj.

Dimensions in mm:
- Length: 71.4 mm
- Width: 25.5 mm
- Height: 92 mm
- Depth min: 5 mm
- Diameter: 0.2 mm

CAUTION!
ESD SENSITIVE

SIVERS
WAVEGUIDE SWITCH
WR90/R100/WG16 Fail-safe

Dimensions in mm:
- Length: 71.4 mm
- Width: 25.5 mm
- Height: 92 mm
- Depth min: 5 mm
- Diameter: 0.2 mm

CAUTION!
ESD SENSITIVE

This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party.
RF DATA

Frequency range  8.2 – 12.4 GHz
VSWR  1.08
Insertion loss  0.1 dB
Isolation  90 dB
Peak power  250 kW at 0.1 MPa abs., +25°C
Average power  3 kW
Flange interface  MIL-DTL-3922/53D-016
Modified with M4, thread depth min 5

ACTUATOR DATA

Operating voltage  28±3 V DC
Operating current  1 A, Auto switch on to holding current after 200 ms
Holding current  300 mA
Switching time  300 ms, Self cut off
Duty (min time between successive operations)  500 ms -40°C to +40°C, linearly increasing to 2 s at +85°C
Connector  MS 3112E 10-6P
Mating connector  MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current  30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material  Aluminium alloy, Cu free
Finishing  Chromate per MIL-C-5541 and black painted
Air pressure  0.1 MPa overpr. Max
Air leakage  10 cm³/min (0.1 MPa overpr.) Max
Weight  0.5 kg Max
Life  250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature  -40°C to +85°C
Vibration  5 – 18 Hz, 3 mm amplitude
  18 – 2000 Hz, 15 g
Humidity  100%RH if dry air in waveguide
RF DATA
Frequency range  8.2 – 12.4 GHz
VSWR   1.08
Insertion loss  0.1 dB
Isolation   60 dB
Peak power   250 kW at 0.1 MPa abs., +25°C
Average power  3 kW
Flange interface MIL-DTL-3922/53D-016
Modified with M4, thread depth min 5

ACTUATOR DATA
Operating voltage  28 ± 3 VDC
Operating current  1 A, Self cut off
Holding current  0.3 A
Switching time  150 ms
Duty (min time between  500 ms -40°C to +40°C
successive operations)  linearly increasing to 2 s at +85°C
Connector   Soldering pins

POSITION INDICATOR
Position indicator current 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA
Material   Aluminium alloy, Cu free
Finishing   Chromate per MIL-C-5541 and black painted
Air pressure   0.1 MPa overpr. Max
Air leakage   10 cm³ /min. (0.1 MPa overpr.) Max
Weight   0.35 kg Max
Life   250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature  -40°C to +85°C
Vibration   5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity   100%RH if dry air in waveguide
This document must not be copied without our written permission,
RF DATA
Frequency range 8.2 – 12.4 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 60 dB
Peak power 250 kW at 0.1 MPa abs., +25°C
Average power 3 kW
Flange interface MIL-DTL-3922/53D-016
Modified with M4, thread depth min 5

ACTUATOR DATA
Operating voltage 28±3 VDC
Operating current 1 A, Self cut off
Holding current 0.3 A
Switching time 150 ms
Duty (min time between 500 ms -40°C to +40°C successive operations) linearly increasing to 2 s at +85°C
Connector Soldering pins

POSITION INDICATOR
Position indicator current 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA
Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min. (0.1 MPa overpr.) Max
Weight 0.35 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature -40°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
**CAUTION!** ESD SENSITIVE

Never connect supply voltages to pins A and C simultaneously. Severe damage will result.

**CAUTION!**

Shown in Pos I (Actuated)

---

**RF DATA**

- Frequency range: 8.2 – 12.4 GHz
- VSWR: 1.08
- Insertion loss: 0.1 dB
- Isolation: 60 dB
- Peak power: 250 kW at 0.1 MPa abs., +25°C
- Average power: 3 kW

**Flange interface**: MIL-DTL-3922/53D-016

**Modified with M4, thread depth min 5**

---

**ACTUATOR DATA**

- Operating voltage: 28 ± 3 VDC
- Operating current: 1 A, Self cut off
- Switching time: 150 ms
- Duty (min time between 500 ms -40°C to +40°C) linearly increasing to 2 s at +85°C

**Connector**: Soldering pins

---

**POSITION INDICATOR**

- Position indicator current: 60 V Max, 50 mA Max Resistive load

---

**MECHANICAL DATA**

- Material: Aluminium alloy, Cu free
- Finishing: Chromate per MIL-C-5541 and black painted
- Air pressure: 0.1 MPa overpressure Max
- Air leakage: 10 cm³ /min. (0.1 MPa overpr.) Max
- Weight: 0.35 kg Max
- Life: 250 000 actuations

---

**ENVIRONMENTAL DATA**

- Ambient temperature: -40°C to +85°C
- Vibration: 5 – 18 Hz, 3 mm amplitude
- 18 – 2000 Hz, 15 g
- Humidity: 100%RH if dry air in waveguide

---

This document is our property and shall not without our written permission be altered, copied or communicated to a third party.

© SIVERS LAB AB

---

**DRAWING**

WS8089X/00

---

**Title**

WAVEGUIDE SWITCH
WR90/R100/WG16 Latching

---

**Scale**

1:1

**Doc. no.**

WS8089X/00
RF DATA
- Frequency range: 8.2 – 12.4 GHz
- VSWR: 1.08
- Insertion loss: 0.1 dB
- Isolation: 60 dB
- Peak power: 250 kW at 0.1 MPa abs., +25°C
- Average power: 3 kW
- Flange interface: MIL-DTL-3922/53D-016
  Modified with M4, thread depth min 5

ACTUATOR DATA
- Operating voltage: 28±3 VDC
- Operating current: 1 A, Self cut off
- Switching time: 150 ms
- Duty (min time between successive operations): linearity increasing to 2 s at +85°C
- Connector: Soldering pins

POSITION INDICATOR
- Position indicator current: 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA
- Material: Aluminium alloy, Cu free
- Finishing: Chromate per MIL-C-5541 and black painted
- Air pressure: 0.1 MPa overpressure Max
- Air leakage: 10 cm³/min. (0.1 MPa overpr.) Max
- Weight: 0.35 kg Max
- Life: 250 000 actuations

ENVIRONMENTAL DATA
- Ambient temperature: -40°C to +85°C
- Vibration: 5 – 18 Hz, 3 mm amplitude
  18 – 2000 Hz, 15 g
- Humidity: 100%RH if dry air in waveguide

WS 8089X/00
**UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:**

- General tolerances, linear and angular dimensions: ISO 2768-c
- Drawing principle: SS 1902
- Tolerancing principle: ISO 8015

**RF DATA**

- Frequency range: 8.2 – 12.4 GHz
- VSWR: 1.08
- Insertion loss: 0.1 dB
- Isolation: 60 dB
- Peak power: 250 kW at 0.1 MPa abs., +25°C
- Average power: 3 kW
- Flange interface: MIL-DTL-3922/53D-016

**ACTUATOR DATA**

- Operating voltage: 28 ±3 V DC
- Operating current: 1 A, Self cut off
- Switching time: 100 ms
- Duty (min time between: 500 ms -20°C to +40°C successively operations) linearly increasing to 2 s at +70°C

**Connector**

- MS 3112E 14-19P
- Mating connector: MS 3116F 14-19S or eq.

**POSITION INDICATOR**

- Voltage / Current: 30 V Max, 100 mA Max Resistive load
- Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

**MECHANICAL DATA**

- Material: Aluminium alloy, Cu free
- Finishing: Chromate per MIL-C-5541 and black painted
- Air pressure: 0.1 MPa overpr. Max
- Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
- Weight: 0.45 kg Max
- Life: 250 000 actuations

**ENVIRONMENTAL DATA**

- Ambient temperature: -20°C to +70°C
- Vibration: 5 – 18 Hz, 3 mm amplitude
- 18 – 2000 Hz, 15 g
- Humidity: 100%RH if dry air in waveguide

---

**CAUTION!**

ESD SENSITIVE

---

**SIVERS**

**WAVEGUIDE SWITCH**

WR90/R100/WG16  Latching

---

**CAD-dokument**

Får ej revideras manuellt

---

**This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose.**

© Sivers Lab AB, Sweden

---
RF DATA
Frequency range: 8.2 – 12.4 GHz
VSWR: 1.08
Insertion loss: 0.1 dB
Isolation: 60 dB
Peak power: 250 kW at 0.1 MPa abs., +25°C
Average power: 3 kW
Flange interface: MIL-DTL-3922/53D-016
Modified with M4, thread depth min 5

ACTUATOR DATA
Operating voltage: 28±3 V DC
Operating current: 1 A, Self cut off
Switching time: 100 ms
Duty (min time between successive operations): 500 ms -20°C to +40°C
linearly increasing to 2 s at +70°C
Connector: MS 3112E 14-19P
Mating connector: MS 3116F 14-19S or eq.

POSITION INDICATOR
Voltage / Current: 30 V Max, 100 mA Max Resistive load
Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material: Aluminium alloy, Cu free
Finishing: Chromate per MIL-C-5541 and black painted
Air pressure: 0.1 MPa overpr. Max
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
Weight: 0.45 kg Max
Life: 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature: -20°C to +70°C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

- General tolerances, linear and angular dimensions: ISO 2768-c
- Europ. proj.

Dimensions in mm

Title: WAVEGUIDE SWITCH
- WR75/R120/WG17
- Latching

Drawing principle: SS 1902
- ISO 8015

CAUTION!
- ESD SENSITIVE

NAME LABEL

Shown in Pos I (A actuated)
RF DATA

Frequency range: 10 - 15 GHz
VSWR: 1.08
Insertion loss: 0.1 dB
Isolation: 90 dB
Peak power: 250 kW at 0.1 MPa abs., +25°C
Average power: 2 kW
Flange interface: MIL-DTL-3922/70B-005
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage: 28±3 V DC
Operating current: 1 A, Self cut off
Switching time: 300 ms
Duty (min time between successive operations): 500 ms -40°C to +40°C
linearly increasing to 1 s at +85°C
Connector: MS 3112E 10-6P
Mating connector: MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current: 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material: Aluminium alloy, Cu free
Finishing: Chromate per MIL-C-5541 and black painted
Air pressure: 0.1 MPa overpr. Max
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
Weight: 0.5 kg Max
Life: 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature: -40°C to +85°C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide

WS 8086M/00
GENERAL TOLERANCES, LINEAR AND ANGULAR DIMENSIONS:

ISO 2768-c

DRAWING PRINCIPLE

TOLERANCING PRINCIPLE

SS 1902

ISO 8015

UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

GENERAL TOLERANCES, LINEAR AND ANGULAR DIMENSIONS: ISO 2768-c

NAME LABEL

CAUTION!

ESD SENSITIVE

Shown in de-energized position

REFERENCE APPLIED ORIGIN DATE ISSUE DATE ISSUE PAGE DOCUMENT

HNg HW 2003-11-12 2003-11-12 B 2 (2) WS 8087M/00

This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose.

© Sivers Lab AB, Sweden

SIVERS

WAVEGUIDE SWITCH

WR75/R120/WG17 Fail-safe

Doc. no. WS8087M/00

Scale 1:5

Sheet 1 (2)

Ref. 2003-1112  Chkd. HNg  HW

Sign. HW

Issued B

Dimensions in mm

Electrical connections

C NC

B Com

A Pos I

F Pos.

Ind.

4x M4

Depth min 5

Φ 0.2

57.15

25.5

92

71.4

43

WS8087M/00

Drawing principle SS 1902

Tolerancing principle ISO 8015

Material: Aluminium alloy, Cu free

Finishing: Chromate per MIL-C-5541 and black painted

Air pressure: 0.1 MPa overpr. Max

Air leakage: 10 cm³/min (0.1 MPa overpr.) Max

Weight: 0.5 kg Max

Life: 250 000 actuations

Ambient temperature: -40 °C to +85 °C

Vibration: 5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity: 100%RH if dry air in waveguide

VSWR 1.08

Isolation 90 dB

Insertion loss 0.1 dB

Peak power 250 kW at 0.1 MPa abs., +25 °C

Average power 2 kW

Flange interface MIL-DTL-3922/70B-00

Modified with 6-32 UNC-2B, thread depth min 5

Actuator

Operating voltage 28 ± 3 V DC

Operating current 1 A, Auto switch on to holding current after 200 ms

Holding current 300 mA

Switching time 300 ms

Duty (min time between 500 ms -40 °C to +40 °C successive operations) linearly increasing to 2 s at +85 °C

Connector MS 3112E 10-6P

Mating connector MS 3116F 10-6S or eq.

Position indicator

Voltage/Current 30 V Max, 100 mA Max Resistive load

Mechanical data

Material: Aluminium alloy, Cu free

Finishing: Chromate per MIL-C-5541 and black painted

Air pressure: 0.1 MPa overpr. Max

Air leakage: 10 cm³/min (0.1 MPa overpr.) Max

Weight: 0.5 kg Max

Life: 250 000 actuations

Environment data

Ambient temperature: -40 °C to +85 °C

Vibration: 5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity: 100%RH if dry air in waveguide

RF DATA

Frequency range 10 - 15 GHz

Insertion loss 0.1 dB

Isolation 90 dB

Peak power 250 kW at 0.1 MPa abs., +25 °C

Average power 2 kW

Flange interface MIL-DTL-3922/70B-00

Modified with 6-32 UNC-2B, thread depth min 5
RF DATA

Frequency range  10 - 15 GHz
VSWR          1.08
Insertion loss  0.1 dB
Isolation      90 dB
Peak power     250 kW at 0.1 MPa abs., +25°C
Average power  2 kW
Flange interface MIL-DTL-3922/70B-005
                 Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage  28±3 V DC
Operating current  1 A, Auto switch on to holding current after 200 ms
Holding current   300 mA
Switching time    300 ms
Duty (min time between successive operations) linearly increasing to 2 s at +85°C
Connector        MS 3112E 10-6P
Mating connector MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current  30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material         Aluminium alloy, Cu free
Finishing        Chromate per MIL-C-5541 and black painted
Air pressure     0.1 MPa overpr. Max
Air leakage      10 cm³/min (0.1 MPa overpr.) Max
Weight           0.5 kg Max
Life             250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -40°C to +85°C
Vibration        5 – 18 Hz, 3 mm amplitude
                  18 – 2000 Hz, 15 g
Humidity         100%RH if dry air in waveguide
CAUTION!

Never connect supply voltages to pins A and C simultaneously. Severe damage will result.

CAUTION!

ESD SENSITIVE

4x M4
Depth min 5
Ø 0.2

Dimensions in mm:

73
21

47.6 ±0.3
RF DATA

Frequency range 10 – 15 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 60 dB
Peak power 200 kW at 0.1 MPa abs., +25°C
Average power 3 kW
Flange interface MIL-DTL-3922/70B-005
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage 28 ± 3 VDC
Operating current 1 A, Self cut off
Switching time 150 ms
Duty (min time between successive operations) 500 ms -40°C to +40°C linearly increasing to 2 s at +85°C
Connector Soldering pins

POSITION INDICATOR

Position indicator current 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpressure
Air leakage 10 cm³/min. (0.1 MPa overpr.) Max
Weight 0.35 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -40°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude 18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide

WS 8089M/00
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

Dimensions in mm

**CAUTION!**

ESD SENSITIVE

**MANUAL OVERRIDE**

**INHIBIT**

Opened during VSWR > 1.2

**Position Indicators**

Three sets of C-form contacts and one set of inhibit contact, opened during VSWR > 1.2

**Mechanical Data**

Material: Aluminium alloy, Cu free

Finishing: Chromate per MIL-C-5541 and black painted

Air pressure: 0.1 MPa overpr. Max

Air leakage: 10 cm³/min (0.1 MPa overpr.) Max

Weight: 0.45 kg Max

Life: 250 000 actuations

**Environmental Data**

Ambient temperature: -20 °C to +70 °C

Vibration: 5 – 18 Hz, 3 mm amplitude

18 – 2000 Hz, 15 g

Humidity: 100%RH if dry air in waveguide

**RF Data**

Frequency range: 10 – 15 GHz

VSWR: 1.08

Insertion loss: 0.1 dB

Isolation: 70 dB

Peak power: 250 kW at 0.1 MPa abs., +25 °C

Average power: 2 kW

**Flange Interface**

MIL-DTL-3922/70B-00 Modified with 6-32 UNC-2B, thread depth min 5

**Actuator Data**

Operating voltage: 28 ± 3 V DC

Operating current: 1 A, Self cut off

Switching time: 100 ms

Duty: (min time between 500 ms - 20 °C to +40 °C) linearly increasing to 2 s at +70 °C

**Connector**

MS 3112E 14-19P

**Position Indicator**

Voltage / Current: 30 V Max, 100 mA Max Resistive load

Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR > 1.2

**Drawing Principle**

SS 1902

**Tolerancing Principle**

ISO 8015

**Title**

WAVEGUIDE SWITCH

WR75/R120/WG17

Latching
RF DATA
Frequency range 10 – 15 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 70 dB
Peak power 250 kW at 0.1 MPa abs., +25°C
Average power 2 kW
Flange interface MIL-DTL-3922/70B-005
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA
Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 100 ms
Duty (min time between successive operations) 500 ms -20°C to +40°C
linearly increasing to 2 s at +70°C
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR
Voltage / Current 30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.45 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature -20°C to +70°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
### General tolerances, linear and angular dimensions:

ISO 2768-c

### Drawing principle

- **Ref.** SS 1902
- **Tolerancing principle** ISO 8015
- **Dimensions in mm**

### Title

**SIVERS**

**Waveguide Switch**

WR75/R120/WG17 Latching with COAX DPDT

### Environmental Data

- **Ambient temperature:** -20°C to +70°C
- **Vibration:** 5 – 18 Hz, 3 mm amplitude
- **Humidity:** 100%RH if dry air in waveguide

### Mechanical Data

- **Material:** Aluminium alloy, Cu-free
- **Finishing:** Chromate per MIL-C-5541
- **Air Pressure:** 0.1 MPa overpr. max
- **Air Leakage:** 10 cm³/min (0.1 MPa overpr.) max
- **Weight:** 0.6 kg max
- **Life:** 250,000 actuations

### Summary

- **Dimension in mm:**
  - 47.6
  - 20
  - 21
  - 118
  - 94
  - 102
  - 40
  - 15.56

- **Legend:**
  - A: Pos I
  - B: Com
  - C: Pos II
  - D: Pos. Ind. 1
  - E: Pos. Ind. 2
  - F: Pos. Ind. 3
  - G: Ctrl. circ.
  - H: INHIBIT

- **Note:**
  - Opened during VSWR >1.2

- **CAUTION!**
  - ESD SENSITIVE

- **Modification:**
  - 030710 MTr HW
  - 2003-1015 HNg HW

- **Signed:**
  - CEl

- **This document is our property and shall not without our written permission be altered, copied or communicated to a third party.**

- **Reference Approved Origin Date Issue Date Issue Page Document:**
  - HNg HW 2003-03-17 2003-11-05 C 2 (2)

- **Doc. no.:** WS8189M/70
RF DATA

Waveguide
Frequency range 10 – 15 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 70 dB
Peak power 250 kW at 0.1 MPa abs., +25°C
Average power 2 kW
Flange interface MIL-DTL-3922/70B-005
Modified with 6 – 32 UNC-2B, thread depth min 6

Coax
Frequency range 10 – 15 GHz
VSWR 1.5
Insertion loss 0.5 dB
Isolation 50 dB
Peak power 5 kW
Average power 15 W max
Coax connector SMA-female
Isolation, waveguide-coax 120 dB

ACTUATOR DATA
Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 100 ms
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR
Voltage / Current 30 V Max, 100 mA Max Resistive load
Position indicator Tree sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA
Material Aluminium alloy; Cu-free
Finishing Chromate per MIL-C-5541
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.6 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature -20°C to +70°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

4x M4
Depth min 5

Boston North Pole

Dimensions in mm

Title
WAVEGUIDE SWITCH
WR62/R140/WG18  Latching

Drawn by
Sivers

Tolerancing principle
ISO 8015

Material
Aluminium alloy, Cu free

Configuration

Name label

Dimensions

Placement

Top view

CAUTION!
ESD SENSITIVE

This document is our property and shall not without our written permission be altered, copied or communicated to a third party.

© Sivers AB, Sweden
RF DATA

Frequency range 12.4 – 18.0 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 90 dB
Peak power 125 kW at 0.1 MPa abs., +25°C
Average power 2 kW
Waveguide size WR62 / R140 / WG18
Hole dimensions according to MIL-DTL-3922/53D-018 (6-32 UNC-2B)
thread depth min 5

ACTUATOR DATA

Operating voltage 28±3 V DC
Operating current 1 A, Self cut off
Switching time 300 ms
Duty (min time between 500 ms -40°C to +40°C successive operations) linearly increasing to 2 s at +85°C
Connector MS 3112E 10-6P
Mating connector MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpr. Max
Air leakage 10 cm³/min (0.1 MPa overpr.) Max
Weight 0.5 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -40°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
WAVEGUIDE SWITCH
WR62/R140/WG18  Fail-safe

CAUTION!
ESD SENSITIVE

Dimensions in mm

92
71.4
25.5

Top view

Ref.
Chkd.
Appvd.
Sign.
Sign.
Sign.
Sheet
Scale
Issue
Doc. no.

EUROPEAN PROJ.
ISO 2768-c

GENERAL TOLERANCES, LINEAR AND ANGULAR DIMENSIONS:

NAME LABEL

4x M4
Depth min 5

43
57,15

HNg
MW

SIVERS LAB AB

This document is our property and shall not without our written permission be altered, copied or communicated to a third party.
RF DATA

Frequency range: 12.4 – 18.0 GHz
VSWR: 1.08
Insertion loss: 0.1 dB
Isolation: 90 dB
Peak power: 125 kW at 0.1 MPa abs., +25°C
Average power: 2 kW
Flange interface: MIL-DTL-3922/53D-005
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage: 28±3 V DC
Operating current: 1 A, Auto switch on to holding current after 200 ms
Holding current: 300 mA
Switching time: 300 ms
Duty (min time between successive operations): linearly increasing to 2 s at +85°C
Connector: MS 3112E 10-6P
Mating connector: MS 3116F 10-6S or eq.

POSITION INDICATOR

Voltage / Current: 30 V Max, 100 mA Max Resistive load

MECHANICAL DATA

Material: Aluminium alloy, Cu free
Finishing: Chromate per MIL-C-5541 and black painted
Air pressure: 0.1 MPa overpr. Max
Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
Weight: 0.5 kg Max
Life: 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature: -40°C to +85°C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide
CAUTION!
ESD SENSITIVE

RF DATA
Frequency range 12.4 – 18.0 GHz
VSWR 1.08
Insertion loss 0.1 dB
Isolation 60 dB
Peak power 125 kW at 0.1 MPa abs., +25°C
Average power 2 kW
Flange interface MIL-DTL-3922/53D-018

ACTUATOR DATA
Operating voltage 28 ±3 VDC
Operating current 1 A, Self cut off
Holding current 0.3 A
Switching time 150 ms
Duty (min time between 500 ms -40°C to +40°C) linearly increasing to 2 s at +85°C
Connector Soldering pins

POSITION INDICATOR
Position indicator current 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA
Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpressure Max
Air leakage 10 cm³/min. (0.1 MPa overpr.) Max
Weight 0.35 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature -40°C to +85°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
### RF DATA

Frequency range: 12.4 – 18.0 GHz  
VSWR: 1.08  
Insertion loss: 0.1 dB  
Isolation: 60 dB  
Peak power: 125 kW at 0.1 MPa abs., +25°C  
Average power: 2 kW  
Flange interface: MIL-DTL-3922/53D-018 Modified with 6-32 UNC-2B, thread depth min 5

### ACTUATOR DATA

Operating voltage: 28±3 VDC  
Operating current: 1A, Self cut off  
Holding current: 0.3 A  
Switching time: 150 ms  
Duty (min time between successive operations): 500 ms -40°C to +40°C linearly increasing to 2 s at +85°C  
Connector: Soldering pins

### POSITION INDICATOR

Position indicator current: 60 V Max, 50 mA Max Resistive load

### MECHANICAL DATA

Material: Aluminium alloy, Cu free  
Finishing: Chromate per MIL-C-5541 and black painted  
Air pressure: 0.1 MPa overpressure Max  
Air leakage: 10 cm³/min. (0.1 MPa overpr.) Max  
Weight: 0.35 kg Max  
Life: 250 000 actuations

### ENVIRONMENTAL DATA

Ambient temperature: -40°C to +85°C  
Vibration: 5 – 18 Hz, 3 mm amplitude  
18 – 2000 Hz, 15 g  
Humidity: 100%RH if dry air in waveguide

---

**WS 8088P/00**
**CAUTION!**
Never connect supply voltages to pins A and C simultaneously. Severe damage will result.

**CAUTION!**
ESD SENSITIVE

**RF DATA**
- Frequency range: 12.4 – 18.0 GHz
- VSWR: 1.08
- Insertion loss: 0.1 dB
- Isolation: 60 dB
- Peak power: 125 kW at 0.1 MPa abs., +25°C
- Average power: 2 kW
- Flange interface: MIL-DTL-3922/53D-018

**ACTUATOR DATA**
- Operating voltage: 28 ±3 VDC
- Operating current: 1 A, Self cut off
- Switching time: 150 ms
- Duty (min time between 500 ms -40°C to +40°C linearly increasing to 2 s at +85°C)

**Connector**
- Soldering pins

**POSITION INDICATOR**
- Position indicator current: 60 V Max, 50 mA Max Resistive load

**MECHANICAL DATA**
- Material: Aluminium alloy, Cu free
- Finishing: Chromate per MIL-C-5541 and black painted
- Air pressure: 0.1 MPa overpressure Max
- Air leakage: 10 cm³/min. (0.1 MPa overpr.) Max
- Weight: 0.35 kg Max
- Life: 250 000 actuations

**ENVIRONMENTAL DATA**
- Ambient temperature: -40°C to +85°C
- Vibration: 5 – 18 Hz, 3 mm amplitude
- 18 – 2000 Hz, 15 g
- Humidity: 100%RH if dry air in waveguide

**SIVERS**

**Title**
WR62/R140/WG18 Latching

**Scale**
1:1

**Doc. no.**
WS8089P/00
RF DATA
Frequency range  12.4 – 18.0 GHz
VSWR  1.08
Insertion loss  0.1 dB
Isolation  60 dB
Peak power  125 kW at 0.1 MPa abs., +25°C
Average power  2 kW
Flange interface  MIL-DTL-3922/53D-018
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA
Operating voltage  28 ± 3 VDC
Operating current  1 A, Self cut off
Switching time  150 ms
Duty (min time between successive operations)  increasing to 2 s at +85°C
Connector  Soldering pins

POSITION INDICATOR
Position indicator current  60 V Max, 50 mA Max Resistive load

MECHANICAL DATA
Material  Aluminium alloy, Cu free
Finishing  Chromate per MIL-C-5541 and black painted
Air pressure  0.1 MPa overpressure Max
Air leakage  10 cm³/min. (0.1 MPa overpr.) Max
Weight  0.35 kg Max
Life  250 000 actuations

ENVIRONMENTAL DATA
Ambient temperature  -40°C to +85°C
Vibration  5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity  100%RH if dry air in waveguide
**WAVEGUIDE SWITCH**

**WR62/R140/WG18**  
Latching

**Dimensions in mm**

**4x M4**  
Depth min 5

**MANUAL OVERRIDE**

**CAUTION!**  
ESD SENSITIVE

**DRAWING**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Modification</th>
<th>Date</th>
<th>Sign.</th>
<th>Chkd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>ECO</td>
<td>2004-0426</td>
<td>HNg</td>
<td>HW</td>
</tr>
</tbody>
</table>

**DRAWING INFORMATION**

- **Scale**: 1:1.5
- **Issue**: F
- **Doc. no**: WS 8189P/00

**REFERENCES**

- **Ref.** 2004-0426
- **Sign.** HNg

**GENERAL TOLERANCES**

- **Linear and Angular Dimensions**: ISO 2768-c

**MECHANICAL DATA**

- **Material**: Aluminium alloy, Cu free
- **Finishing**: Chromate per MIL-C-5541 and black painted
- **Air Pressure**: 0.1 MPa overpr. Max
- **Air Leakage**: 10 cm³/min (0.1 MPa overpr.) Max
- **Weight**: 0.45 kg Max
- **Life**: 250,000 actuations

**ENVIRONMENTAL DATA**

- **Ambient Temperature**: -20°C to +70°C
- **Vibration**: 5 – 18 Hz, 3 mm amplitude
- **Humidity**: 100%RH if dry air in waveguide

**RF DATA**

- **Frequency Range**: 12.4 – 18.0 GHz
- **VSWR**: 1.05
- **Insertion Loss**: 0.1 dB
- **Isolation**: 60 dB
- **Peak Power**: 125 kW at 0.1 MPa abs., +25°C
- **Average Power**: 2 kW

**Flange Interface**: MIL-DTL-3922/53D-018

**ACTUATOR DATA**

- **Operating Voltage**: 28 ± 3 VDC
- **Operating Current**: 1 A, Self cut off
- **Switching Time**: 100 ms
- **Duty**: (min time between 500 ms -20°C to +40°C linearly increasing to 2 s at +70°C)

**Connector**: MS 3112E 14-19P

**Mating Connector**: MS 3116F 14-19S or eq.

**POSITION INDICATOR**

- **Voltage / Current**: 30 V Max, 100 mA Max Resistive load
- **Position Indicator**: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose. © Sivers Lab AB, Sweden
RF DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>12.4 – 18.0 GHz</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.05</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>60 dB</td>
</tr>
<tr>
<td>Peak power</td>
<td>125 kW at 0.1 MPa abs., +25°C</td>
</tr>
<tr>
<td>Average power</td>
<td>2 kW</td>
</tr>
<tr>
<td>Flange interface</td>
<td>MIL-DTL-3922/53D-018, Modified with 6-32 UNC-2B, thread depth min 5</td>
</tr>
</tbody>
</table>

ACTUATOR DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>28±3 VDC</td>
</tr>
<tr>
<td>Operating current</td>
<td>1 A, Self cut off</td>
</tr>
<tr>
<td>Switching time</td>
<td>100 ms</td>
</tr>
<tr>
<td>Duty (min time between</td>
<td>500 ms -20°C to +40°C linearly</td>
</tr>
<tr>
<td>successive operations)</td>
<td>increasing to 2 s at +70°C</td>
</tr>
<tr>
<td>Connector</td>
<td>MS 3112E 14-19P</td>
</tr>
<tr>
<td>Mating connector</td>
<td>MS 3116F 14-19S or eq.</td>
</tr>
</tbody>
</table>

POSITION INDICATOR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage / Current</td>
<td>30 V Max, 100 mA Max Resistive load</td>
</tr>
<tr>
<td>Position indicator</td>
<td>Three sets of C-form contacts and one set of inhibit contact, opened during VSWR &gt;1.2</td>
</tr>
</tbody>
</table>

MECHANICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Aluminium alloy, Cu free</td>
</tr>
<tr>
<td>Finishing</td>
<td>Chromate per MIL-C-5541 and black painted</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.1 MPa overpr. Max</td>
</tr>
<tr>
<td>Air leakage</td>
<td>10 cm³/min (0.1 MPa overpr.) Max</td>
</tr>
<tr>
<td>Weight</td>
<td>0.45 kg Max</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>5 – 18 Hz, 3 mm amplitude</td>
</tr>
<tr>
<td></td>
<td>18 – 2000 Hz, 15 g</td>
</tr>
<tr>
<td>Humidity</td>
<td>100%RH if dry air in waveguide</td>
</tr>
</tbody>
</table>
This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose.

© Sivers Lab AB, Sweden

---

**Title:** WAVEGUIDE SWITCH

**Ref.:** 021129  
**Sign.:** CEL

**Chkd.:** HW

**Designed:**  
**Sign.:** HW

**Appvd.:** 
**Sign.:** HW

---

**Drawing principle:** SS 1902

**Tolerancing principle:** ISO 8015

---

**Dimensions in mm**

---

**General tolerances, linear and angular dimensions:** ISO 2768-c

---

**Legend:**

- Ctrl. circ.
- Pos. I
- Com
- Pos. II
- Pos. Ind. 1
- Pos. Ind. 2
- Pos. Ind. 3
- INHIBIT

---

**Checked by:** HNg

**Approved by:** HW

**Designed by:** HW

---

**Scale:** 1:2

**Issue:** 1 (2)

**Doc. no.:** WS8189P/70

---

**Notes:**

- Shown in Pos I (A actuated)
- Opened during VSWR >1.2
- CAUTION! ESD SENSITIVE
### RF DATA

**Waveguide**
- Frequency range: 12.4 – 18.0 GHz
- VSWR: 1.05
- Insertion loss: 0.1 dB
- Isolation: 60 dB
- Peak power: 125 kW at 0.1 MPa abs., +25°C
- Average power: 2 kW
- Flange interface: MIL-DTL-3922/53D-018
  - Modified with 6 – 32 UNF-2B, thread depth min 6

**Coax**
- Frequency range: 12.4 – 18.0 GHz
- VSWR: 1.5
- Insertion loss: 0.5 dB
- Isolation: 40 dB
- Peak power: 5 kW
- Average power: 15 W max
- Coax connector: SMA-female

Isolation, waveguide-coax: 120 dB

### ACTUATOR DATA

- Operating voltage: 28±3 V DC
- Operating current: 1 A, Self cut off
- Switching time: 100 ms
- Connector: MS 3112E 14-19P
- Mating connector: MS 3116F 14-19S or eq.

### POSITION INDICATOR

- Voltage / Current: 30 V Max, 100 mA Max Resistive load
- Position indicator: Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

### MECHANICAL DATA

- Material: Aluminium alloy; Cu-free
- Finishing: Chromate per MIL-C-5541
- Air pressure: 0.1 MPa overpr. Max
- Air leakage: 10 cm³/min (0.1 MPa overpr.) Max
- Weight: 0.6 kg Max
- Life: 250 000 actuations

### ENVIRONMENTAL DATA

- Ambient temperature: -20°C to +70°C
- Vibration: 5 – 18 Hz, 3 mm amplitude
- 18 – 2000 Hz, 15 g
- Humidity: 100%RH if dry air in waveguide

---

**WS 8189P/70**

---

© Sivers Lab AB, Sweden
**DRAWING SHEET 1 OF 2**

**Title:** WAVEGUIDE SWITCH

**Description:** WR42/R220/WG20  Latching

**Drawing No.:** WS 8189K/00

---

**Dimensions in mm**

- **Width:** 102 mm
- **Height:** 94 mm
- **Depth:** 47.6 mm
- **Thickness:** 21 mm

**Notes:**
- **CAUTION:** ESD SENSITIVE
- **MANUAL OVERRIDE**
- **4x M4**
- Depth min 5
- **ϕ 0.2**

---

**UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:**

- General tolerances, linear and angular dimensions: ISO 2768-c
- **Europ. proj.**

---

**Legend:**

- A: Pos I
- B: Com
- C: Pos II
- D: Pos.
- E: Ind. 1
- F: G: Pos.
- H: Ind. 2
- J: K: Pos.
- L: Ind. 3
- N: INHIBIT
- Ctrl. circ.

---

**SIVERS LAB AB**

**Reference Approved Origin date Issue date Issue Page Document**

- HNg HW 2002-03-05 2003-11-05 C 2 (2) WS 8189K/00

---

**RF DATA**

- **Frequency range:** 18.0 – 26.5 GHz
- **VSWR:** 1.10
- **Insertion loss:** 0.1 dB
- **Isolation:** 70 dB
- **Peak power:** 30 kW at 0.1 MPa abs., +25 °C
- **Average power:** 500 W
- **Flange interface:** MIL-F-3922/70B-028

---

**Modified with 4-40 UNC-2B, thread depth min 7.5**

---

**ACTUATOR DATA**

- **Operating voltage:** 28 ± 3 V DC
- **Operating current:** 1 A, Self cut off
- **Switching time:** 100 ms
- **Duty (min time between successive operations):** linearly increasing to 2 s at +70 °C

---

**Connector:** MS 3112E 14-19P

---

**Mating connector:** MS 3116F 14-19S or eq.

---

**POSITION INDICATOR**

- **Voltage / Current:** 30 V Max, 100 mA Max Resistive load
- **Position indicator:** Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

---

**MECHANICAL DATA**

- **Material:** Aluminium alloy, Cu free
- **Finishing:** Chromate per MIL-C-5541 and black painted
- **Air pressure:** 0.1 MPa overpr. Max
- **Air leakage:** 10 cm³ /min (0.1 MPa overpr.) Max
- **Weight:** 0.5 kg Max
- **Life:** 250,000 actuations

---

**ENVIRONMENTAL DATA**

- **Ambient temperature:** -20 °C to +70 °C
- **Vibration:** 5 – 18 Hz, 3 mm amplitude
- **18 – 2000 Hz, 15 g**
- **Humidity:** 100%RH if dry air in waveguide

---

**This document must not be copied without our written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose. © Sivers Lab AB, Sweden**

---

**Modification and Chk.**

- **B:** Tapped holes changed to 4-40 UNC-2B
- **C:** ECO

**Issue Date:** 030311  CEL HW

**Sign. and Chk.:** CEL HW

**Doc. no:** WS 8189K/00
RF DATA

Frequency range  18.0 – 26.5 GHz
VSWR   1.10
Insertion loss  0.1 dB
Isolation   70 dB
Peak power   30 kW at 0.1 MPa abs., +25°C
Average power 500 W
Flange interface MIL-F-3922/70B-028
Modified with 4-40 UNC-2B, thread depth min 7.5

ACTUATOR DATA

Operating voltage  28±3 V DC
Operating current  1 A, Self cut off
Switching time  100 ms
Duty (min time between successive operations)  500 ms -20°C to +40°C
linearly increasing to 2 s at +70°C
Connector MS 3112E 14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR

Voltage / Current  30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA

Material  Aluminium alloy, Cu free
Finishing  Chromate per MIL-C-5541 and black painted
Air pressure  0.1 MPa overpr. Max
Air leakage  10 cm³/min (0.1 MPa overpr.) Max
Weight  0.5 kg Max
Life  250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -20°C to +70°C
Vibration  5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity  100%RH if dry air in waveguide
**Title:** WAVEGUIDE SWITCH
**Ref:** WS8089Q/00

**SIVERS**

**Drawing principle:** SS 1902
**Tolerancing principle:** ISO 8015

---

**Dimensions in mm**

- **Top view**
  - A: Pos I
  - B: Com
  - C: Pos II
  - D: Ctrl. circ.
  - E: Pos. Ind.
  - F: Shown in Pos I (A actuated)

**Notes:**
- **CAUTION!**
  - ESD SENSITIVE

- **Never connect supply voltages to pins A and C simultaneously. Severe damage will result.**

**Drawing principle**
- **EUROPEAN PROJECT**
- **General tolerances, linear and angular dimensions:** ISO 2768-c

---

**General information**

- **Ref.:** 02-11-28
- **Sign:** CEL
- **Chkd.:** HW
- **Design:** 02-11-28
- **Sign:** HW
- **Apprv.:** HW

**Issue:** B

**Sheet:** 1/21

**Scale:** 1:1

---

**Notes:**
- **UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:**
  - General tolerances, linear and angular dimensions: ISO 2768-c

**CAUTION:**

- No unauthorised copying or communication to a third party is allowed.

(C) Sivers Lab AB, Sweden
## RF DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>26.5 – 40.0 GHz</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.1</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>60 dB</td>
</tr>
<tr>
<td>Peak power</td>
<td>20 kW at 0.1 MPa abs., +25°C</td>
</tr>
<tr>
<td>Average power</td>
<td>0.5 kW</td>
</tr>
<tr>
<td>Flange interface</td>
<td>MIL-F-3922/54C-003 Modified with 4-40 UNC-2B, thread depth min 5</td>
</tr>
</tbody>
</table>

## ACTUATOR DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>28±3 V DC</td>
</tr>
<tr>
<td>Operating current</td>
<td>1 A, Self cut off</td>
</tr>
<tr>
<td>Switching time</td>
<td>150 ms</td>
</tr>
<tr>
<td>Duty (min time between</td>
<td>500 ms -40°C to +40°C</td>
</tr>
<tr>
<td>successive operations)</td>
<td>linearly increasing to 2 s at +85°C</td>
</tr>
<tr>
<td>Connector</td>
<td>Soldering pins</td>
</tr>
</tbody>
</table>

## POSITION INDICATOR

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage / Current</td>
<td>60 V Max, 50 mA Max Resistive load</td>
</tr>
</tbody>
</table>

## MECHANICAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Aluminium alloy, Cu free</td>
</tr>
<tr>
<td>Finish</td>
<td>Chromate per MIL-C-5541 and black painted</td>
</tr>
<tr>
<td>Air pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Air leakage</td>
<td>N/A</td>
</tr>
<tr>
<td>Weight</td>
<td>0.35 kg Max</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations</td>
</tr>
</tbody>
</table>

## ENVIRONMENTAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>5 – 18 Hz, 3 mm amplitude</td>
</tr>
<tr>
<td></td>
<td>18 – 2000 Hz, 15 g</td>
</tr>
<tr>
<td>Humidity</td>
<td>100% RH if dry air in waveguide</td>
</tr>
</tbody>
</table>
UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

Dimensions in mm

- **Title**: WAVEGUIDE SWITCH
- **Ref.**: 01-06-21
- **Sign.**: AKn
- **Chkd.**: A

- **Dimensions**:
  - Length: 102 mm
  - Width: 40 mm
  - Height: 94 mm
  - Thickness: 21 mm
  - Depth: 47.6 mm
  - Hole diameter: 0.2 mm

- **Material**: Aluminium alloy, Cu free
- **Finish**: Chromate per MIL-C-5541 and black painted
- **Air Pressure**: 0.1 MPa overpressure
- **Air Leakage**: 10 cm³/min. (0.1 MPa overpr.)
- **Weight**: 0.45 kg Max
- **Life**: 250,000 actuations

- **Vibration**: 5 – 18 Hz, 3 mm amplitude
- **Humidity**: 100%RH if dry air in waveguide

- **RF DATA**:
  - Frequency range: 5.8 – 16.0 GHz
  - VSWR: 1.2
  - Insertion loss: 0.4 dB
  - Isolation: 50 dB
  - Peak Power: 30 kW at 0.1 MPa abs., +25 °C
  - Average Power: 750 W

- **Flange Interface**: WRD 580

- **Modification Date**: 2004-04-26
- **Issue Date**: B
- **Sign.**: HNg
- **Sheet**: 2

---

**CAUTION! ESD SENSITIVE**

---

**Drawing principle**: SS 1902

**Tolerancing principle**: ISO 8015

**Ref.**: WS 8189D58/00

**Designed**: SIVERS LAB AB

**Scale**: 1:1

**Issue**: B

**Doc. no.**: WS 8189D58/00
RF DATA

Frequency range 5.8 – 16.0 GHz
VSWR 1.2
Insertion loss 0.4 dB
Isolation 50 dB
Peak power 30 kW at 0.1 MPa abs., +25°C
Average power 750 W
Flange interface WRD 580
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage 28±3 VDC
Operating current 1 A, Self cut off
Switching time 100 ms
Duty (min time between successive operations) 500 ms -20°C to +40°C
linearly increasing to 2 s at +70°C
Connector MS 3112 E14-19P
Mating connector MS 3116F 14-19S or eq.

POSITION INDICATOR

Voltage / Current 30 V Max, 100 mA Max Resistive load
Position indicator Three sets of C-form contacts and one set of inhibit contact, opened during VSWR >1.2

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpressure
Air leakage 10 cm³/min. (0.1 MPa overpr.) Max
Weight 0.45 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -20°C to +70°C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide
This document is our property and shall not without our written permission be altered, copied or communicated to a third party.

CAUTION!

ESD SENSITIVE

Never connect supply voltages to pins A and C simultaneously. Severe damage will result.

CAUTION!

RF DATA

Frequency range 6.5 – 18.0 GHz
VSWR 1.2
Insertion loss 0.4 dB
Isolation 50 dB
Peak power 20 kW at 0.1 MPa abs., +25 °C
Average power 500 W
Flange interface See page 2

ACTUATOR DATA

Operating voltage 28 ±3 VDC
Operating current 1 A, Self cut off
Switching time 150 ms
Duty (min time between 500 ms -40 °C to +40 °C successive operations) linearly increasing to 2 s at +85 °C
Connector Soldering pins

POSITION INDICATOR

Position indicator current 60 V Max, 50 mA Max Resistive load

MECHANICAL DATA

Material Aluminium alloy, Cu free
Finishing Chromate per MIL-C-5541 and black painted
Air pressure 0.1 MPa overpressure Max
Air leakage 10 cm³/min. (0.1 MPa overpr.) Max
Weight 0.35 kg Max
Life 250 000 actuations

ENVIRONMENTAL DATA

Ambient temperature -40 °C to +85 °C
Vibration 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity 100%RH if dry air in waveguide

UNLESS OTHERWISE STATED THE FOLLOWING APPLIES:

General tolerances, linear and angular dimensions: ISO 2768-c

© Sivers Lab AB, Sweden

WS 8089D6/00
**RF DATA**

- **Frequency range**: 6.5 – 18.0 GHz
- **VSWR**: 1.2
- **Insertion loss**: 0.4 dB
- **Isolation**: 50 dB
- **Peak power**: 20 kW at 0.1 MPa abs., +25°C
- **Average power**: 500 W
- **Flange interface**: See page 2

**ACTUATOR DATA**

- **Operating voltage**: 28 ± 3 VDC
- **Operating current**: 1 A, Self cut off
- **Switching time**: 150 ms
- **Duty (min time between successive operations)**: 500 ms -40°C to +40°C, linearly increasing to 2 s at +85°C
- **Connector**: Soldering pins

**POSITION INDICATOR**

- **Position indicator current**: 60 V Max, 50 mA Max Resistive load

**MECHANICAL DATA**

- **Material**: Aluminium alloy, Cu free
- **Finishing**: Chromate per MIL-C-5541 and black painted
- **Air pressure**: 0.1 MPa overpressure Max
- **Air leakage**: 10 cm³/min. (0.1 MPa overpr.) Max
- **Weight**: 0.35 kg Max
- **Life**: 250 000 actuations

**ENVIRONMENTAL DATA**

- **Ambient temperature**: -40°C to +85°C
- **Vibration**: 5 – 18 Hz, 3 mm amplitude
- **Humidity**: 18 – 2000 Hz, 15 g
- **Humidity**: 100%RH if dry air in waveguide
CAUTION!
Never connect supply voltages to pins A and C simultaneously.
Severe damage will result.

CAUTION!
ESD SENSITIVE

Dimensions in mm

Material: Aluminium alloy, Cu free
Finishing: Chromate per MIL-C-5541 and black painted
Air pressure: 0.1 MPa overpressure max
Air leakage: 10 cm³/min. (0.1 MPa overpr.)
Weight: 0.35 kg max
Life: 250,000 actuations

ENVIRONMENTAL DATA

Ambient temperature: -40 °C to +85 °C
Vibration: 5 – 18 Hz, 3 mm amplitude
18 – 2000 Hz, 15 g
Humidity: 100%RH if dry air in waveguide

RF DATA

Frequency range: 7.5 – 18.0 GHz
VSWR: 1.2
Insertion loss: 0.4 dB
Isolation: 40 dB
Peak power: 30 kW at 0.1 MPa abs., +25 °C
Average power: 750 W
Flange interface: MIL-F-39000/3-074
Modified with 6-32 UNC-2B, thread depth min 5

ACTUATOR DATA

Operating voltage: 28 ± 3 VDC
Operating current: 1 A, Self cut off
Switching time: 150 ms
Duty (min time between 500 ms -40 °C to +40 °C) linearly increasing to 2 s at +85 °C
Connector: Soldering pins

POSITION INDICATOR

Position indicator current: 60 V Max, 50 mA Max
Resistive load

MECHANICAL DATA

Title: WAVEGUIDE SWITCH
WRD 750 D24 Latching

Drawing principle: SS 1902
Tolerancing principle: ISO 8015

General tolerances, linear and angular dimensions: ISO 2768-c

UTLLESS OTHERWISE STATED THE FOLLOWING APPLIES:

© SIVERS AB
### RF DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>7.5 – 18.0 GHz</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.2</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>0.4 dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>40 dB</td>
</tr>
<tr>
<td>Peak power</td>
<td>30 kW at 0.1 MPa abs., +25°C</td>
</tr>
<tr>
<td>Average power</td>
<td>750 W</td>
</tr>
<tr>
<td>Flange interface</td>
<td>MIL-F-39000/3-074</td>
</tr>
<tr>
<td></td>
<td>Modified with 6-32 UNC-2B, thread depth min 5</td>
</tr>
</tbody>
</table>

### ACTUATOR DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>28±3 VDC</td>
</tr>
<tr>
<td>Operating current</td>
<td>1 A, Self cut off</td>
</tr>
<tr>
<td>Switching time</td>
<td>150 ms</td>
</tr>
<tr>
<td>Duty (min time between</td>
<td>500 ms -40°C to +40°C</td>
</tr>
<tr>
<td>successive operations)</td>
<td>linearly increasing to 2 s at +85°C</td>
</tr>
<tr>
<td>Connector</td>
<td>Soldering pins</td>
</tr>
</tbody>
</table>

### POSITION INDICATOR

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position indicator current</td>
<td>60 V Max, 50 mA Max Resistive load</td>
</tr>
</tbody>
</table>

### MECHANICAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Aluminium alloy, Cu free</td>
</tr>
<tr>
<td>Finishing</td>
<td>Chromate per MIL-C-5541 and black painted</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.1 MPa overpressure Max</td>
</tr>
<tr>
<td>Air leakage</td>
<td>10 cm³/min. (0.1 MPa overpr.)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.35 kg Max</td>
</tr>
<tr>
<td>Life</td>
<td>250 000 actuations</td>
</tr>
</tbody>
</table>

### ENVIRONMENTAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>5 – 18 Hz, 3 mm amplitude, 18 – 2000 Hz, 15 g</td>
</tr>
<tr>
<td>Humidity</td>
<td>100%RH if dry air in waveguide</td>
</tr>
</tbody>
</table>

**WS 8089D7/00**
### Sivers Standard Flange Dimensions

<table>
<thead>
<tr>
<th>W/G Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E (10 x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 284</td>
<td>29,57</td>
<td>14,68</td>
<td>48,62</td>
<td>32,54</td>
<td>M6, Depth min 8</td>
</tr>
<tr>
<td>WR 229</td>
<td>26,67</td>
<td>12,7</td>
<td>41,15</td>
<td>27,18</td>
<td>M6, Depth min 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>W/G Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E (8x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 187</td>
<td>22,22</td>
<td>9,52</td>
<td>32,33</td>
<td>12,7</td>
<td>M6, Depth min 8</td>
</tr>
<tr>
<td>WR 137</td>
<td>17,26</td>
<td>7,95</td>
<td>27,79</td>
<td>11,12</td>
<td>10-32 UNF-2B, Depth min 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>W/G Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>C (4x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 112</td>
<td>18,72</td>
<td>17,17</td>
<td></td>
<td>M4, depth min 5 or 10-32 UNC-2B, depth min 8</td>
</tr>
<tr>
<td>WR 90</td>
<td>16,26</td>
<td>15,49</td>
<td></td>
<td>M4, depth min 5</td>
</tr>
<tr>
<td>WR 75</td>
<td>14,25</td>
<td>13,21</td>
<td></td>
<td>6-32 UNC-2B, depth min 5</td>
</tr>
<tr>
<td>WR 62</td>
<td>12,14</td>
<td>12,62</td>
<td></td>
<td>6-32 UNC-2B, depth min 5</td>
</tr>
<tr>
<td>WR 42</td>
<td>8,51</td>
<td>8,13</td>
<td></td>
<td>4-40 UNC-2B, depth min 5</td>
</tr>
<tr>
<td>WR 28</td>
<td>6,73</td>
<td>6,35</td>
<td></td>
<td>4-40 UNC-2B, depth min 5</td>
</tr>
</tbody>
</table>