



# STATEMENT OF CONFORMITY

Statement No.:  
10000489330-PA-DNV-IND

Project Nr.:  
PRJN-286106-2021-PA-IND

Validity:  
22 December 2021 to 21 December, 2024

This statement consists of 6 pages

This is to certify that the Functional Safety Capability of

## **Filter, Pressure Regulator, Filter Regulator, Lubricator & Volume Booster**

as per table shown in Page 2 ,3 & 4 of this certificate

Manufactured by

### **SHAVO NORGREN (INDIA) PVT. LTD.**

Regd. Off: 74, Mittal Chambers, Nariman Point, Mumbai 400 021, Maharashtra, INDIA

Factory: R-545& R-640, M.I.D.C., T.T.C. Industrial Area, Rabale, Navi Mumbai - 400 701, Maharashtra, INDIA

has been assessed and found to confirm to the Functional safety standards and sub- clauses:

### **IEC 61508:2010 Parts 1 to 7**

The above products and its associated data contained herein can be considered for use in the design of safety functions up to and including

### **SIL 3**

When used in accordance with the scope and conditions of this certificate.

The Safety Integrity Level (SIL) relates to the complete safety System, not the individual elements, therefore this certificate only demonstrates the capability of the product to be implemented into a safety system of a required integrity level as defined above.

Further details are given in the following pages

Place and date:  
Mumbai  
22.12.2021

For the issuing office:

**DNV Business Assurance India Pvt Ltd**

**Manojkumar Panchal**  
Head of Section, Manager - Product Assurance

## Statement history:

| Revision | Description          | Issue Date |
|----------|----------------------|------------|
| 0.0      | Original Certificate | 2021-12-22 |

## Products covered by this Statement:

### 1. Filter

Table 1: Filter

| Model | Pipe Size                      | Volume (cc) | Drawing               | Rev No |
|-------|--------------------------------|-------------|-----------------------|--------|
| SF10G | 1/8", 1/4"                     | 25          | SN-6196-01            | R1     |
| SF10C | 1/8", 1/4"                     | 25          | SN-6197-01            | R1     |
| SF15G | 1/4", 3/8"                     | 135         | SN-6264-01            | R2     |
| SF15C | 1/4", 3/8"                     | 135         | SN-6265-01            | R2     |
| SF20G | 1/4", 3/8", 1/2"               | 200         | SN-6202-01            | R2     |
| SF20C | 1/4", 3/8", 1/2"               | 200         | SN-6201-01            | R2     |
| SF20V | 1/4", 3/8", 1/2"               | 200         | SN-6203-01            | R1     |
| SF60G | 1/4", 3/8", 1/2", 3/4", 1"     | 320         | SN-6208-01            | R2     |
| SF60C | 1/4", 3/8", 1/2", 3/4", 1"     | 320         | SN-6209-01            | R2     |
| SF60H | 1/4", 3/8", 1/2", 3/4", 1"     | 320         | SN-6210-01            | R2     |
| SF60V | 1/4", 3/8", 1/2", 3/4", 1"     | 320         | SN-6211-01            | R1     |
| SFO2  | 1/4", 3/8", 1/2", 3/4",        | 320         | SN-6190-01            | R2     |
| SF70G | 3/4", 1", 1 1/4", 1 1/2", 2"   | 1200        | SN-6215-01            | R2     |
| SF70C | 3/4", 1", 1 1/4", 1 1/2", 2"   | 1200        | SN-6216-01            | R2     |
| SF17G | 1", 1 1/4", 1 1/2"             | 1200        | SN-6269-01            | R2     |
| SF18G | 1 1/2", 2"                     | 3500        | SN-6220-01            | R2     |
| SF51C | 1/4" TO 1"                     | 320         | SN-6227-01            | R2     |
| SF50C | 1/4" TO 1"                     | 400         | SN-6226-01            | R2     |
| SF46  | 1/2", 3/4", 1", 1 1/4", 1 1/2" | 1200        | SN-6224-01            | R2     |
| SF47  | 1 1/2", 2"                     | 3500        | SN-6223-01            | R2     |
| SF77G | 1/8", 1/4"                     | 25          | SN-6233-01            | R1     |
| SF27G | 1/4", 3/8"                     | 200         | SN-6236-01            | R2     |
| SF27C | 1/4", 3/8"                     | 200         | SN-6237-01            | R2     |
| SF27V | 1/4", 3/8"                     | 200         | SN-6238-01            | R1     |
| SF37G | 1/4", 3/8", 1/2", 3/4"         | 150         | SN-6250-01/SN-6244-01 | R2     |
| SF37G | 1", 1 1/2"                     | 375         | SN-6245-01            | R2     |
| SF67G | 1/2", 3/4"                     | 220         | SN-6254-01            | R2     |
| SF67C | 1/2", 3/4"                     | 220         | SN-6255-01            | R1     |
| SF67V | 1/2", 3/4"                     | 220         | SN-6066-01            | R1     |
| SF67G | 1", 1 1/2", 2"                 | 735         | SN-6253-01            | R2     |
| SF97  | 1/8", 1/4"                     | 25          | SN-6346-01            | R1     |
| SF88  | 1/2", 3/4", 1", 1 1/4"         | 1200        | SN-6345-01            | R1     |



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Revision No.: 0.0

## 2. Pressure Regulator

**Table 2: Pressure Regulator**

| Model       | Pipe Size                    | Volume (cc) | Drawing               | Rev No |
|-------------|------------------------------|-------------|-----------------------|--------|
| SR07        | 1/8", 1/4"                   | 20          | SN-6194-01            | R1     |
| SR10        | 1/8", 1/4"                   | 20          | SN-6198-01            | R1     |
| SR15        | 1/4", 3/8"                   | 60          | SN-6266-01            | R1     |
| SR20        | 1/4", 3/8", 1/2"             | 130         | SN-6204-01            | R1     |
| SR60        | 1/4", 3/8", 1/2", 3/4", 1"   | 200         | SN-6212-01            | R1     |
| SRO2        | 1/4", 3/8", 1/2", 3/4"       | 200         | SN-6193-01            | R1     |
| SR17        | 1", 1 1/4", 1 1/2"           | 300         | SN-6270-01            | R1     |
| SR70        | 1", 1 1/4", 1 1/2", 2"       | 320         | SN-6218-01            | R1     |
| SR18        | 1 1/2", 2"                   | 1500        | SN-6221-01            | R1     |
| SR48        | 1/4" TO 1"                   | 500         | SN-6225-01            | R1     |
| SR28        | 1/4"                         | 200         | SN-6242-01            | R1     |
| 11-4SNR(AL) | 1/4", 3/8", 1/2"             | 80          | SN-6231-01/SN-6230-01 | R1     |
| 11-4SNR(AL) | 1/4"                         | 80          | SN-6636-01            | R0     |
| SR97        | 1/8", 1/4"                   | 15          | SN-6263-01            | R1     |
| SR88        | 3/4", 1", 1 1/4", 1 1/2", 2" | 500         | SN-6262-01            | R1     |
| SR77        | 1/8", 1/4"                   | 20          | SN-6044-01            | R1     |
| SR27        | 1/4", 3/8"                   | 120         | SN-6240-01            | R1     |
| SR67        | 1/2", 3/4"                   | 150         | SN-6258-01            | R1     |
| SR67        | 1", 1 1/2", 2"               | 495         | SN-6257-01            | R1     |
| SR37        | 1/4" TO 3/4"                 | 150         | SN-6246-01/SN-6247-01 | R1     |
| SR37        | 1", 1 1/2"                   | 300         | SN-6248-01            | R1     |
| 114SNR (SS) | 1/4"                         | 80          | SN-6232-01            | R2     |
| SR57        | 1 1/2", 2"                   | 1500        | SN-6338-01            | R1     |

## 3. Filter Regulator

**Table 3: Filter Regulator**

| Model       | Pipe Size                    | Volume (cc) | Drawing               | Rev No |
|-------------|------------------------------|-------------|-----------------------|--------|
| SB07        | 1/8", 1/4"                   | 25          | SN-6195-01            | R1     |
| SB10        | 1/8", 1/4"                   | 25          | SN-6199-01            | R1     |
| SB15        | 1/4", 3/8"                   | 100         | SN-6267-01            | R2     |
| SB20        | 1/4", 3/8", 1/2"             | 210         | SN-6207-01            | R2     |
| SB60        | 1/4", 3/8", 1/2", 3/4", 1"   | 330         | SN-6213-01            | R2     |
| SBO2        | 1/4", 3/8", 1/2", 3/4"       | 330         | SN-6191-01            | R2     |
| SB70        | 3/4", 1", 1 1/4", 1 1/2", 2" | 1400        | SN-6217-01            | R2     |
| 11-4SN (AL) | 1/4", 3/8", 1/2"             | 75          | SN-6229-01            | R3     |
| SB77        | 1/8", 1/4"                   | 25          | SN-6045-01            | R1     |
| SB27        | 1/4", 3/8"                   | 210         | SN-6239-01            | R2     |
| SB67        | 1/2", 3/4"                   | 220         | SN-6261-01            | R2     |
| SB67        | 1", 3/2", 2"                 | 740         | SN-6260-01            | R2     |
| SB37        | 1/4" TO 3/4"                 | 150         | SN-6249-01/SN-6252-01 | R2     |
| SB37        | 1", 3/2"                     | 400         | SN-6251-01            | R2     |
| 11-4SN (SS) | 1/4"                         | 75          | SN-6228-01            | R2     |



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## 4. Lubricator

**Table 4: Lubricator**

| Model    | Pipe Size                | Volume (cc) | Drawing               | Rev No |
|----------|--------------------------|-------------|-----------------------|--------|
| SL10     | 1/8",1/4"                | 25          | SN-6200-01            | R1     |
| SL15 M/C | 1/4",3/8",               | 135         | SN-6268-01/SN-6329-01 | R1     |
| SL20 M/C | 1/4",3/8",1/2"           | 200         | SN-6206-01/SN-6205-01 | R1     |
| SL60 M/C | 1/4",3/8",1/2",3/4",1"   | 300         | SN-6214-01            | R1     |
| SLO12    | 1/4",3/8",1/2",3/4"      | 300         | SN-6192-01            | R1     |
| SL17M/C  | 1",1 1/4",1 1/2"         | 1200        | SN-6272-01/SN-6271-01 | R1     |
| SL70M/C  | 3/4",1",1 1/4",1 1/2",2" | 1200        | SN-6219-01            | R1     |
| SL18     | 1 1/2",2"                | 1500        | SN-6222-01            | R1     |
| SL27     | 1/4", 3/8"               | 200         | SN-6241-01            | R1     |
| SL67     | 1/2",3/4"                | 220         | SN-6259-01            | R1     |

## 5. Volume Booster

**Table 5: Volume Booster**

| Model                   | Pipe Size  | Volume (cc) | Drawing    | Rev No |
|-------------------------|------------|-------------|------------|--------|
| VB60 (AL)               | 1/4",3/8"  | 75          | SN-6275-02 | R1     |
| VB60 (AL) STANDARD FLOW | 1/2",3/4 " | 150         | SN-6276-01 | R2     |
| VB60 (AL) HIGH FLOW     | 1/2",3/4 " | 225         | SN-6273-02 | R2     |
| VB60 (SS)               | 1/4",3/8"  | 75          | SN-6275-01 | R2     |
| VB60 (SS) STANDARD FLOW | 1/2",3/4 " | 150         | SN-6276-02 | R1     |
| VB60 (SS) HIGH FLOW     | 1/2",3/4 " | 225         | SN-6273-01 | R2     |
| VB60 (AL) SUPER FLOW    | 1/2",3/4 " | 250         | SN-6743-02 | R0     |
| VB60 (SS) SUPER FLOW    | 1/2",3/4 " | 250         | SN-6744-02 | R0     |

## Applied Standards:

IEC 61508:2010 Parts 1 to 7

## Product Details:

Safety function under consideration: As per SIL Safety Case Report SC286106-01

Architectural constraints: HFT: 1

Random Hardware Failure Rates (FIT): As per below Table 6 & 7

**Table 6: Field Experience Data**

| Product            | Working Hours (since...) | Working Hours until | Cumulated Working hours | Total Failure Hours |
|--------------------|--------------------------|---------------------|-------------------------|---------------------|
| Filter             | 01.04.2012               | 31.3.2021           | 3.9E09                  | 712                 |
| Pressure Regulator | 01.04.2012               | 31.3.2021           | 4.6E09                  | 3860                |
| Filter Regulator   | 01.04.2012               | 31.3.2021           | 27.88E09                | 12496               |
| Lubricator         | 01.04.2012               | 31.3.2021           | 2.24E09                 | 1432                |
| Volume Booster     | 01.04.2016               | 31.3.2021           | 6776112                 | 12                  |

**Table 7: PFD Calculation using Field Experience Data**

| Product            | Cumulated working hours | Dangerous Failures considered | Dangerous undetected failure rate | PFD <sub>avg</sub> (On Low Demand mode0) |
|--------------------|-------------------------|-------------------------------|-----------------------------------|------------------------------------------|
| Filter             | 3.9E09                  | 712                           | 1.83E-07                          | 8.0E-04 for HFT=0<br>8.1E-05 for HFT=1   |
| Pressure Regulator | 4.6E09                  | 3860                          | 8.39E-07                          | 3.7E-03 for HFT=0<br>3.8E-04 for HFT=1   |
| Filter Regulator   | 27.88E09                | 12496                         | 4.48E-07                          | 1.9E-03 for HFT=0<br>2.0E-04 for HFT=1   |
| Lubricator         | 2.24E09                 | 1432                          | 6.39E-07                          | 2.8E-03 for HFT=0<br>2.9E-04 for HFT=1   |
| Volume Booster     | 6776112                 | 24                            | 2.12 E-07                         | 7.8E-03 for HFT=0<br>8.5E-04 for HFT=1   |

Hardware Safety Integrity Compliance<sup>[1]</sup>  
Systematic Safety Integrity Compliance  
61508 Part 2 Systematic Capability<sup>[2]</sup>  
Overall SIL Capability Achieved<sup>[3]</sup>

Route 2<sub>H</sub>  
NA as per clause 7.4.2 of IEC  
SC 3  
SIL 3 (for HFT=1)/SIL 2 (for HFT=0)

<sup>[1]</sup> According to IEC 61508:2010 Part 2 Clause 7.4.2, 7.4.3 & 7.4.4

<sup>[2]</sup> According to IEC 61508:2010 Part 4 Clause 3.5.9

<sup>[3]</sup> Lowest SIL indicated

#### Information supporting the failure data

- |                                          |                                             |
|------------------------------------------|---------------------------------------------|
| 1. Product ID                            | : As per Page 2, 3 & 4                      |
| 2. Functional specification              | : As per SIL Safety Case Report SC286106-01 |
| 3. Environmental Limits                  | : NA                                        |
| 4. Lifetime / Replacement Limits         | : 20 Years                                  |
| 5. Maintenance Requirements              | : As detailed in Safety manual              |
| 6. Diagnostic Coverage                   | : NA                                        |
| 7. Diagnostic Test interval              | : NA                                        |
| 8. Evidence of use in similar conditions | : NA                                        |

#### Conditions of Safe Use

1. User shall comply with the detail contained in the manufacturer user manual as well as the information provided above.
2. Selection of this equipment for use in a safety application shall only be made by a competent person.
3. The collection of any data associated with this type for equipment during operations shall be collected and reported to the manufacturer.
4. The product should be tested at regular intervals to identify any malfunctions in accordance with the product safety manual.

#### Conditions of Certificate

1. This certificate is based on voluntary assessment carried out by DNV as recorded in assessment report(s); SIL Safety Case SC286106-01.
2. Printed copies of the certificates are not a controlled version.
3. This certificate is based on the contract (Project No. PRJN-286106-2021-PA-IND), agreed between DNV and SHAVO Norgren (India) Pvt. Ltd.
4. SHAVO Norgren (India) Pvt. Ltd shall ensure the management of functional safety is maintained.
5. DNV shall be notified of any changes to the product that may impact on this certificate during the period of validity.
6. The use of this certificate is subject to the 'certificate agreement' for Functional Safety Certification.
7. This certificate remains the property of DNV and shall be returned upon request.

Other valid terms and conditions are found in the DNV Agreement.

The following may render this statement invalid:

- Changes in the quality system affecting production.
- Periodical audits not held within the allowed time window.

#### END OF STATEMENT