SM SERIES

MICRO SWITCH Premium Subminiature Basic Switches

DESCRIPTION

The industry-defining name in snapaction switches, Honeywell MICRO SWITCH premium subminiature switches are designed for repeatability and enhanced product life. The MICRO SWITCH SM Series delivers consistent performance within a range of conditions.

The MICRO SWITCH SM Series' small size and light weight are combined with ample electrical capacity, precision operation, and extended life. Featuring high precision and repeatability, the SM Series offers gold contacts for low-energy switching and gold bifurcated contacts for maximum reliability. Bifurcated contacts provide parallel redundancy within the SM switch.

The SM switch is available for powerduty switching up to 11 A (Vac) or 1/4 HP (Vac).

DIFFERENTIATION

- Very wide temperature range allows for years of reliable performance in the harshest of conditions
- MIL-PRF-8805 qualified listings
- Operating forces as low as 0,06 N [6 g] and differential travel as low as 0,025 mm [0.001 in] delivers consistent, precise switch characteristics

FEATURES

- Industry-leading mechanical life of up to 10,000,000 operations
- Selection of actuation, electrical termination, and operating characteristics along with hightemperature construction options
- Wide temperature range of -54°C to 204°C [-65°F to 400°F]
- MIL-PRF-8805 qualified listings in a lightweight, small package
- FAA-PMA approvals for commercial aircraft
- Choice of silver or gold-plated, or gold bifurcated contacts to handle a variety of electrical load requirements
- UL/CSA, cUL, ENEC, and CE approvals

VALUE TO CUSTOMERS

- Industry-leading life cycle rating reduces the need to replace switches over life in an OEM platform – reducing total system cost
- Low operating forces
- Mil-qualified listings
- Life of up to 10,000,000 cycles





POTENTIAL APPLICATIONS

- Precision switch assemblies for commercial aircraft to monitor doors for "closed" and "locked" position
- Landing gear monitor
- Precision switch assemblies for commercial cockpit applications for pushbuttons, toggle, or joystick assemblies
- Precision switch assemblies in military applications
- Assemblies for industrial pressure switches and temperature switches
- Power generation fuel level (gas and oil)



PORTFOLIO

The SM Series of premium subminiature basic switches are a part of a strong

offering of submins including SX Series (premium) and ZM, ZM1, ZD, ZX, and ZW Series (standard) switches.



TABLE 1. SPECIFICATIONS	
CHARACTERISTIC	PARAMETER
Differentiator	low operating force to 2 oz. max; power load switching capability to 11 A; motor load handling capacity to $1/4$ HP (Vac)
Ampere rating	0.1 A to 11 A
Circuitry	SPDT
Operating force	0.04 oz to 2 oz
Termination	quick connect, solder, pcb
Actuator	pin plunger, straight lever, roller lever, simulated roller lever, paddle lever
Voltage	115 Vac, 125 Vac, 250 Vac, 30 Vdc
Agency approvals	UL, CE, CSA, ENEC, MIL-PRF-8805, FAA-PMA
Agency file information	CE: 61058-1; UL: E12252; CSA: LR41372
Operating temperature	-54°C to 121°C [-65°F to 250°F]; select catalog listings 204°C [400°F]
Contacts	silver, gold plated, bifurcated gold
Housing	phenolic
Sealing	sealed plunger on 411SM Series, other SM Series not weather sealed
Mechanical life	up to 10,000,000 operations for 11SM listings up to 80,000 operations for 1SM/41SM listings up to 1,000,000 operations for gold bifurcated contact
Size	12,7 mm H x 6,35 mm W x 20,3 mm L [0.5 in H x 0.25 in W x 0.8 in L]

Electrical data and UL codes

Table 2. UL Electrical Ratings

TABLE 2. U	TABLE 2. UL ELECTRICAL RATINGS									
CODE	CIRCUITRY	ELECTRICAL DATA AND UL CODES								
J	SPDT	5 A res., 3 A ind., (sea level), 5 A res., 2.5 A ind., (50,000 feet), 28 Vdc. UL rating: 5 A, 250 Vac								
K	SPDT	UL rating: 5 A, 125 or 250 Vac								
М	SPDT	UL rating: 11 A and 1/4 hp, 125 or 250 Vac								
N	SPDT	1 A res., 0.5 A ind., 30 Vdc. UL rating: 1 A, 125 Vac								
Р	SPDT	1 A res., 30 Vdc. UL rating: .1 A, 125 Vac								
R	SPDT	5 A res., 3 A ind., 2.4 A lamp load (sea level), 5 A res., 2.5 A ind., 2.4 A lamp load, (50,000 feet), 28 Vdc. 5 A res., 5 A ind., 1.5 A lamp load, 115 Vac. 60 Hz (sea level)								
S	SPDT	UL rating: 4 A, 250 Vac								

O.F. • Operating force

R.F. • Release force

P.T. • Pretravel O.T. • Overtravel

D.T. • Differential travel
O.P. • Operating position

TABLE 3. MICRO SWITCH SM SERIES ORDER GUIDE • PIN PLUNGER

	Catalog Listing	Recommended For	Electrical Data and UL Codes	O.F. N [oz]	R.F. min. N [oz]	P.T. max. mm [in]	O.T. min. mm [in]	D.T. mm [in]	O.P. * mm [in]
	11SM1077-T	Gold-plated contacts	0.1 A P	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	12SM604-T	Bifurcated gold contacts, reduced rating	0.1 A P	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,076 [0.003]	0,1 [0.004]	8,38 [0.330]
	11SM23-T	Gold-plated contacts	1 A N	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	12SM4-T	Enhanced reliability (bifurcated gold contacts)	1 A N	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,076 [0.003]	0,1 [0.004]	8,38 [0.330]
	11SM701-T	Lower force	4 A S	0,56 [2]	0,14 [0.5]	0,51 [0.020]	0,13 [0.005]	0,051 [0.002]	8,38 [0.330]
	11SM1-T	General purpose	5 A J	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
11SM1-1	11SM3-T	Operating temps to 121°C [250°F]	5 A J	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
3 6 6	11SM244-T	Operating temps to 204°C [400°F] for 100 hours	5 A	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	11SM401-T	Less differential travel	5 A K	0,97 [3.5] max.	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,025 [0.001]	8,38 [0.330]
	21SM284-T2 (MS25085-2)	MIL-PRF-8805 applications	5 A R	0,83 to 1,39 [3 to 5]	0,28 [1]	0,76 [0.030]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	21SM284 (MS25085-1)	MIL-PRF-8805 applications, solder terminals	5 A R	0,83 to 1,39 [3 to 5]	0,28 [1]	0,76 [0.030]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	22SM1-T	Enhanced stability under varying humidity	5 A J	0,83 to 1,39 [3 to 5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
	41SM1-T	Up to 11 A, 1/4 HP (ac)	11 A M	0,83 to 1,39 [3 to 5]	0,28 [1]	0,76 [0.030]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
L4 5A 250 VAC MX	411SM1	Sealed plunger construction	5 A K	0,83 to 2,09 [3 to 7.5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]
- Cro	411SM23	Sealed plunger construction, gold contacts	1 A N	0,83 to 2,09 [3 to 7.5]	0,28 [1]	0,51 [0.020]	0,13 [0.005]	0,1 [0.004]	8,38 [0.330]

^{*} except where stated ± 0.38 mm [± 0.015 in]

O.F. • Operating force

R.F. • Release force

P.T. • Pretravel

O.T. • Overtravel
D.T. • Differential travel O.P. • Operating position

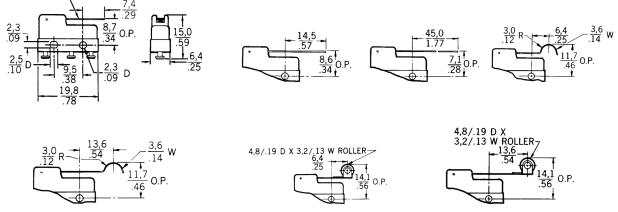
TADLE / MICE		DER GUIDE • INTEGRAL LEVER
IADLE 4. WILL	O SWITCH SM SERIES OR	DER GUIDE • INTEGRAL LEVER

TABLE 4. IMIC		SWI SERIES ORDER GO		III-CINALI					
	Catalog Listing	Recommended For	Electrical Data and UL Codes	O.F. N [oz]	R.F. min. N [oz]	P.T. max. mm [in]	O.T. min. mm [in]	D.T. mm [in]	O.P. * mm [in]
	311SM1-T	7,24 mm [0.285 in] straight lever	5 A J	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,51 [0.020]	0,48 [0.019]	8,64 mm ±1,5 mm [0.34 in ±0.060 in]
311SM1-T	311SM23-T	7,24 mm [0.285 in] straight lever, gold contacts	1 A N	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,51 [0.020]	0,48 [0.019]	8,64 mm ±1,5 mm [0.34 in ±0.060 in]
3 3 5	311SM701-T	7,24 mm [0.285 in] straight lever, lower force	4 A S	0,16 [0.57]	0,03 [0.11]	2,16 [0.085]	0,51 [0.020]	0,36 [0.014]	8,64 mm ±1,5 mm [0.34 in ±0.060 in]
	311SM2-T	14,35 mm [0.565 in] straight lever	5 A J	0,31 [1.1]	0,05 [0.18]	3,05 [0.12]	0,66 [0.026]	0,69 [0.027]	8,51 mm ±2 mm [0.335 in ±0.08 in]
3.15uro2.1	311SM43-T	14,35 mm [0.565 in] straight lever, gold contacts	1 A N	0,31 [1.1]	0,05 [0.18]	3,05 [0.12]	0,66 [0.026]	0,69 [0.027]	8,51 mm ±2 mm [0.335 in ±0.08 in]
- 13	311SM702-T	14,35 mm [0.565 in] straight lever, lower force	4 A S	0,11 [0.4]	0,02 [0.07]	3,05 [0.12]	0,66 [0.026]	0,38 [0.015]	8,51 mm ±2 mm [0.335 in ±0.08 in]
	311SM3-T	44,8 mm [1.765 in] straight lever	5 A J	0,15 [0.53]	0,02 [0.07]	7,87 [0.31]	1,45 [0.057]	2,8 [0.11]	7,11 mm ±4,3 mm [0.28 in ±0.17 in]
	311SM17-H58	44,8 mm [1.765 in] straight lever, gold contacts	1 A N	0,15 [0.53]	0,02 [0.07]	7,87 [0.31]	1,45 [0.057]	2,8 [0.11]	7,11 mm ±4,3 mm [0.28 in ±0.17 in]
	311SM703-T	44,8 mm [1.765 in] straight lever, lower force	4 A S	0,06 [0.2]	0,01 [0.04]	7,87 [0.31]	1,45 [0.057]	1,78 [0.07]	7,11 mm ±4,3 mm [0.28 in ±0.17 in]
	311SM4-T	6,38 mm [0.251 in] simulated roller lever	5 A J	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,46 [0.018]	0,48 [0.019]	11,7 mm ±1,5 mm [0.46 in ±0.06 in]
311SM4-T	311SM25-T	6,38 mm [0.251 in] simu- lated roller lever, gold contacts	1 A N	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,46 [0.018]	0,48 [0.019]	11,7 mm ±1,5 mm [0.46 in ±0.06 in]
3 5 5	311SM704-T	6,38 mm [0.251 in] simulated roller lever, lower force	4 A S	0,16 [0.57]	0,03 [0.11]	2,16 [0.085]	0,46 [0.018]	0,33 [0.013]	11,7 mm ±1,5 mm [0.46 in ±0.06 in]
	311SM5-T	13,6 mm [0.535 in] simulated roller lever	5 A J	0,31 [1.1]	0,05 [0.18]	3,05 [0.12]	0,66 [0.026]	0,69 [0.027]	11,56 mm ±2 mm [0.455 in ±0.08 in]
61126	311SM705-T	13,6 mm [0.535 in] simulated roller lever, lower force	4 A S	0,11 [0.4]	0,02 [0.07]	3,05 [0.12]	0,66 [0.026]	0,38 [0.015]	11,56 mm ±2 mm [0.455 in ±0.08 in]
	311SM6-T	6,38 mm [0.251 in] roller lever	5 A J	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,46 [0.018]	0,48 [0.019]	14,2 mm ±1,5 mm [0.56 in ±0.06 in]
311SM68-T	311SM68-T	6,38 mm [0.251 in] roller lever, gold contacts	1 A N	0,39 [1.4]	0,07 [0.25]	2,16 [0.085]	0,46 [0.018]	0,48 [0.019]	14,2 mm ±1,5 mm [0.56 in ±0.06 in]
3 5 5	311SM706-T	6,38 mm [0.251 in] roller lever, lower force	4 A S	0,16 [0.57]	0,03 [0.11]	2,16 [0.085]	0,46 [0.018]	0,33 [0.013]	14,2 mm ±1,5 mm [0.56 in ±0.06 in]
	311SM7-T	13,6 mm [0.535 in] roller lever	5 A J	0,31 [1.1]	0,05 [0.18]	3,05 [0.12]	0,66 [0.026]	0,69 [0.027]	14,1 mm ±2 mm [0.555 in ±0.08 in]
	111SM1-T	Leaf actuator	5 A J	1,95 [7]	0,56 [2]	5,54 [0.218]	0,76 [0.03]	0,76 [0.03]	8,89 mm ±0,76 mm [0.35 in ±0.03 in]
111SM1-T	111SM17-T	Leaf actuator gold contacts	1 A N	1,95 [7]	0,56 [2]	5,54 [0.218]	0,76 [0.03]	0,76 [0.03]	8,89 mm ±0,76 mm [0.35 in ±0.03 in]
	111SM2-T	Flexible leaf with roller	5 A J	1,95 [7]	0,56 [2]	5,56 [0.219]	0,76 [0.03]	0,64 [0.025]	14,3 mm ±0,76 mm [0.562 in ±0.03 in]
1200	111SM23-T	Flexible leaf with roller, gold contacts	1 A N	1,95 [7]	0,56 [2]	5,56 [0.219]	0,76 [0.03]	0,64 [0.025]	14,3 mm ±0,76 mm [0.562 in ±0.03 in]

	UMERIC DESIGNATIONS D SWITCH SM SERIES/ORDER GUIDE
PREFIX	DESCRIPTION
1SM	Standard pin plunger construction, up to 80,000 operations
11SM	Long-life pin plunger construction, up to 10,000,000 operations
12SM	Gold bifurcated contacts
21SM	Same as 1SM (formerly had DAP material)
22SM	Same as 11SM (formerly had DAP material)
23SM	Same as 12SM (formerly had DAP material)
41SM	11 A construction (11SM construction)
101SM	1SM with an integral leaf actuator
111SM	11SM with an integral spring leaf
112SM	12SM with an integral spring leaf
122SM	22SM with an integral spring leaf
151SM	51SM with an integral spring leaf
301SM	1SM with an integral rigid lever
302SM	1SM with an integral roller lever
311SM	Integral rigid lever
321SM	21SM with an integral rigid lever
322SM	22SM with an integral rigid lever
401SM	Dust/splash resistant 1SM
411SM	Dust/splash resistant 11SM
412SM	Dust/splash resistant 12SM

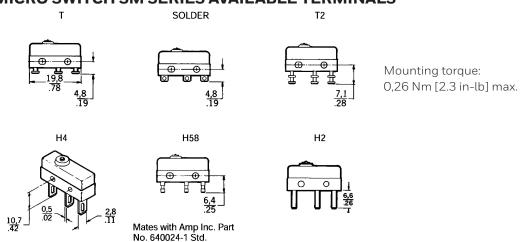
TABLE 5, CONTINUED. NUMERIC DESIGNATIONS FOR MICRO SWITCH SM SERIES/ORDER GUIDE								
SUFFIX DESCRIPTION								
23	Gold contacts							
400	Low differential travel series							
500	Reverse terminal designation							
700	Low force series							
1000	Gold alloy							

TABLE 6. SM SERIES • STANDARD ACTUATOR OPTIONS, SCREW TERMINALS, AND DIMENSIONS (MM/IN) Pin plunger, T terminals Pin plunger, Solder terminals **OPERATING** 7,6 **POSITION** 2,3 .09 D .30 7,6 .30 0.P. .09 49 2,3 .09 $9.\overline{5}$ 4,8 6,<u>4</u> .25 .19_{6,4} 2,8 Integral leaf lever Integral roller lever 4,8/.19 D X 3,2/.13 W ROLLER CORROSION RESISTANT 3,0 .12 STEEL LEAF 7,6 .30 2,3 .09 0.P. 35 9,2 .36 9,5 .38 4,8 4,8 19,8 Integral levers -3,6/.14 W LEVER 7,4 0.P.



NOTE: The two mounting holes accept pins or screws of 2,21 mm (0.087 in) maximum diameter

MICRO SWITCH SM SERIES AVAILABLE TERMINALS



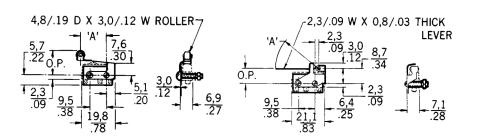
MICRO SWITCH JS SERIES AUXILIARY ACTUATORS FOR THE MICRO SWITCH SM SERIES SWITCHES (stainless steel actuator and hardware)

		Description	Actuator Length	Operting Force max.	Release Force min.	Pretravel max.	Overtravel min.	Differential Travel max.	Operating Point	Free Position max.
JS-2	7	Straight leaf	16,8 mm [0.66 in]	2,78 N [10 oz]	0,56 N [2 oz]	1,98 mm [0.078 in]	0,38 mm [0.015 in]	0,38 mm [0.015 in]	8,89 mm ±0,38 mm [0.350 in ±0.015 in]	11,3 mm [0.445 in]
JS-5		Roller leaf (bronze roller)	15 mm [0.59 in]	2,78 N [10 oz]	0,83 N [3 oz]	1,98 mm [0.078 in]	0,38 mm [0.015 in]	0,38 mm [0.015 in]	14,2 mm ±0,38 mm [0.56 in ±0.015 in	16,9 mm [0.665 in]
JS-7	7	Formed leaf (simulated roller)	14,7 mm [0.58 in]	2,78 N [10 oz]	0,56 N [2 oz]	2,39 mm [0.094 in]	0,79 mm [0.031 in]	0,38 mm [0.015 in]	9,65 mm ±0,38 mm [0.380 in ±0.015 in]	12,7 mm [0.50 in]
JS-220	79	Straight lever	26,2 mm [1.03 in]*	0,28 N [1 oz]	0,04 N [0.14 oz]	3,18 mm [0.125 in] approx.	0,76 mm [0.030 in]	0,76 mm [0.030 in]	10,3 mm [0.41 in] approx.	-
JS-246		Roller lever (steel roller)	25,4 mm [1.00 in]*	0,28 N [1 oz]	0,04 N [0.14 oz]	3,18 mm [0.125 in] approx.	0,76 mm [0.030 in]	0,76 mm [0.030 in]	14,3 mm [0.56 in] approx.	-
JS-221		Formed lever (simulated roller)	25,4 mm [1.00 in]*	0,28 N [1 oz]	0,04 N [0.14 oz]	3,18 mm [0.125 in] approx.	0,76 mm [0.030 in]	0,76 mm [0.030 in]	11,6 mm [0.46 in] approx.	-
JS-33** △		Tandem leaf	5,3 mm [0.21 in]	5,00 N [18 oz]	2,78 N [10 oz]	2,36 mm [0.093 in]	0,15 mm [0.006 in]	0,38 mm [0.015 in]	8,89 mm ±0,38 mm [0.350 in ±0.015 in]	10,5 mm [0.41 in]
JS-31** △		Tandem leaf (bronze roller)	4,3 mm [0.17 in]	11,1 N [40 oz]	4,45 N [16 oz]	2,36 mm [0.093 in]	0,13 mm [0.005 in]	0,38 mm [0.015 in]	14,5 mm ±0,38 mm [0.57 in ±0.015 in]	16,1 mm [0.63 in]

^{**} Travel characteristics on tandem actuators vary with actual basic switch characteristics

NOTE: Above actuators should be used below 300°F

 Δ Plated steel machine screws



^{* &}quot;A" measurement is from pivot point of lever to the point indicated on drawing

ADDITIONAL MATERIALS

The following associated literature is available at sensing.honeywell.com:

- Product installation instructions
- Product range guide
- Aerospace range guide
- · Applying basic switches
- · Low energy switching guide
- Product application-specific information
- Application Note: Central Vacuum System
- Application Note: Electronic Taping Machine
- Application Note: Sensors and Switches in Sanitary Valves
- Application Note: Sensors and
 Switches in Oil Rig Applications
- Application Note: Sensors and Switches for Potential Medical Applications

FOR MORE INFORMATION

Honeywell Sensing and Internet of Things services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sensing.honeywell.com or call:

International +815 618 3231 USA/Canada +302 613 4491

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

△ WARNINGPERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNINGMISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only.
 Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Honeywell:

111SM1 111SM1-T 111SM2-T 11SM1 11SM1-H2 11SM1-H58 11SM1-T 11SM1-T2 11SM23-T 11SM244

11SM244-T 11SM3-T 11SM401 11SM401-T 11SM601-H4 11SM701-T 21SM284 21SM284-T2 311SM1-T

311SM2 311SM2-T 311SM3 311SM3-T 311SM43-T 311SM4-T 311SM68-T 311SM6-T 311SM6-T 311SM702-T 311SM703-T 411SM1 41SM1 41SM1-T 41SM1-T2 111SM115-H2 111SM115-H58 111SM117-H2 111SM119-H2 111SM124-H2 111SM125-H2 111SM1-H58 111SM2 111SM23-T 111SM602-H4 111SM858-H403 11SM1077-T 11SM144

11SM23-H2 11SM2440 11SM3 11SM3-S 11SM401-H58 11SM423-H4 11SM4601-H4 11SM703 11SM712-H58

11SM7601-H4 11SM861-T 11SM8849-H58 122SM44-T2 12SM4-T 12SM83 141SM28-H2 1SM1 1SM36-H2

21SM1-T 21SM368 22SM22-T 22SM426-T 311SM1068-H4 311SM1138-T 311SM23-H4 311SM25-H4 311SM2-H58 311SM3-H58 311SM4 311SM5-T 311SM68-H4 311SM7018-T 311SM701-H58 311SM704-H2

311SM705-T 311SM706-T 311SM717-T 412SM4 41SM1-H2 41SM27-T 41SM28-H2 41SM28-T2