



# DENTAL INDUSTRY APPLICATIONS



NC498-A  
(P-E21-18)

# SMC – Your automation partner for the dental industry

SMC is a world leader in innovative design of automation components specifically suited to the Medical Device, Life Science, and Dental Industry.

Our global network of sales and services, covering over 83 countries, is supported by an expansive manufacturing capacity in order to meet our customers' needs.

We offer over 700,000 products that include technologies for pneumatic and robotic automation, microfluidics, thermo control, high purity liquid and gas, among many others.

Custom design, total solution and component quality are part of our DNA.

Our components...for the life of your device.

## Dental Industry Applications

### Delivery Systems and Chairs



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### Decontamination and Lubrication of Tools



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### Abrasion and Scalers



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### Lasers, Machining, and Aligner Automation



p. 8

### Air and Vacuum Production



p. 5

#### UNIT CONVERSIONS

	unit	conversion	result		unit	conversion	result
length	m	x 3.28	ft	pressure	MPa	x 145	psi
	mm	x 0,04	in		kPa	÷ 6.895	psi
mass	g	x 0,04	oz	temperature	°C	x1.8 then add 32	°F
volume	cm <sup>3</sup>	÷ 16.387	in <sup>3</sup>	torque	N-m	x 0.738	ft-lb
	L	x 61.024	in <sup>3</sup>	force	N	÷ 4.448	lbf
speed	mm/s	÷ 25.4	in/s	flow	L/min	÷ 28.317	cfm

# Dental Delivery Systems and Chairs



2-way Valve for Air (Hand piece)

2-way Valve for Water (Syringe)

Proportional Valve (Hand-piece speed)

2-way Valve for Cuspidor and Lumbar Adjustment on Chair

3-way Valve for Purge Cleaning

Air Gauge or Digital Pressure Switch

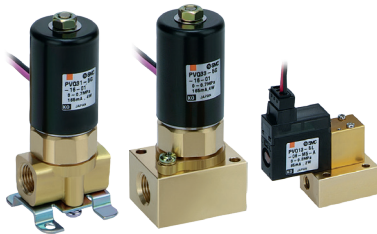
Filter/Regulator for System Air

Strainer/Regulator for System Water

Electric Actuator for Chair Adjustment

## PVQ for Speed Control

- Fluid: air, inert gas
- Flow rate: up to 100 L/min
- Service life: lasts 25 million cycles
- Repeatability: 3% or less
- Can be used for vacuum applications



## V100 3-port Valve for Air

- Flow rate: up to 24 L/min
- Low power consumption: 0.1 W
- 0 MPa to 0.7 MPa
- Valve width: 10 mm



## SFDA Bacteria Removal Filter

- 0.01  $\mu\text{m}$  nominal filtration rating
- HACCP and FSSC22000 standards



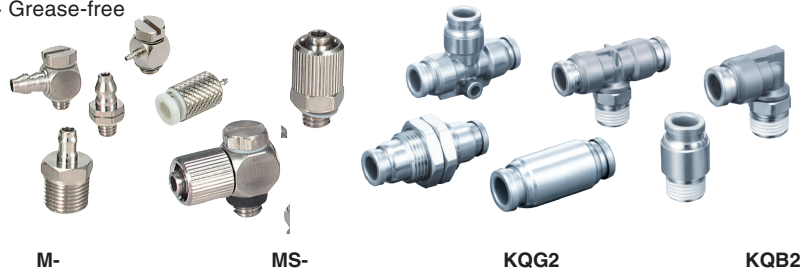
## LVM for Air, Vacuum and Liquids

- Direct operated rocker type / poppet type
- Increased chemical resistance
- Low power consumption
- Almost no change in volume
- Space saving



## M/MS/KQG2/KQB2 Fittings

- Ni-plated brass and stainless steel 316
- Seal parts: FKM / PVC
- Grease-free



M-

MS-

KQG2

KQB2



## Dental Delivery Systems and Chairs

### WR and WF for Water Supply

- Tamperproof, lockable adjustment handle
- Simple maintenance; replaceable mesh
- Resilient body and seal materials

WR



WF



### SX90 for Massage and Lumbar

- 2-port and 3-port Universal
- Operating pressure: -100 kPa to 0.2 MPa
- Flow rate: max 90 L/min (3-port)



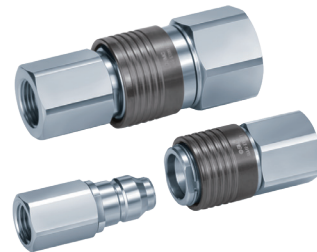
### PSE/ISE for Pressure Monitoring

- Measure condition, program values and alarm points.
- Remote output features



### KKA Coupler for Air and Water

- Body material: Stainless steel 304
- Seal material: Special FKM
- Grease-free



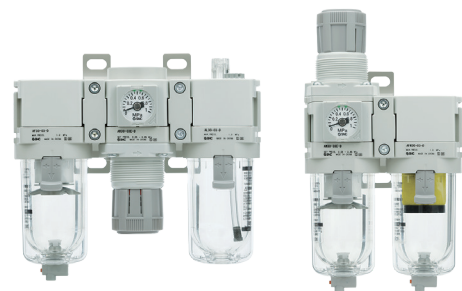
### LEY Electric Actuator for Chair Position

- Work-load: 60 kg (horizontal); 53 kg (vertical)
- Positioning repeatability:  $\pm 0.02$  mm
- Flexible motor types and controls



### AC for Air Supply

- Clean looking, urban white, modular design
- Element and bowl are in one-piece
- Transparent bowl provides 360-degree visibility



# Abrasion and Ultrasonic Scalers



Vacuum and Air Filter for Supply Air

Miniature Regulator

Bacteria Removal Filter

Gauge or Pressure Switch

2-port Poppet Valve

Miniature 3-port Valve

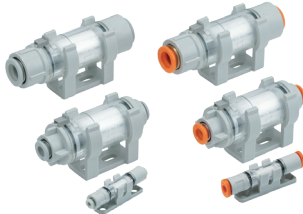
2, 3-port Liquid Isolation Valve

Custom Manifold

Membrane Air Dryer

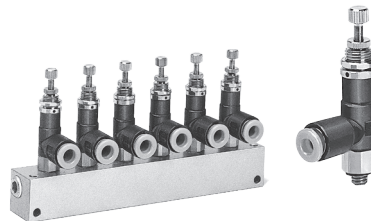
## ZFC In-line Air Filter for Air and Vacuum

- One unit for both positive and negative pressure
- Built-in One-touch fittings
- Optional blue element for easy contaminant detection



## ARJ Miniature Regulator

- Compact and lightweight (16 g)
- Built-in One-touch fittings
- Low cracking pressure 0.02 MPa



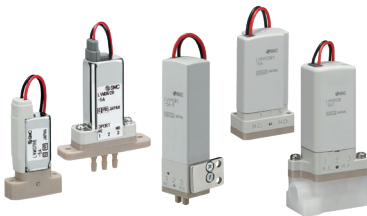
## Bacteria Removal Filter

- Bacteria capture performance:  $LRV \geq 9$
- Use of FDA/Food Sanitation Law compliant materials
- Nominal filtration rating: 0.01  $\mu\text{m}$
- Flow rate: 500 L/min (ANR)



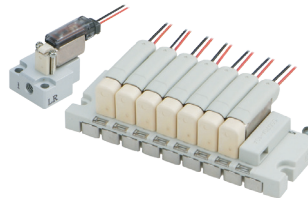
## LVM Liquid Valve

- Compact, direct-acting rocker and poppet
- Wetted part material: PEEK (body/plate)
- Diaphragm choice of EPDM, FKM or Kalrez®
- Available with power-saving circuit



## S070 Mini 3-port Valve for Air

- 3-port solenoid valve, direct operated
- Valve width: 7 mm
- Operation noise: 38 dB(A) or less
- Power consumption: 0.1 W (w/power saving circuit)



## VDW 2-port Valve for Water

- Compact, direct-acting
- available in resin, brass or stainless body
- Grease-free construction available
- Built-in One-touch fittings (resin body)



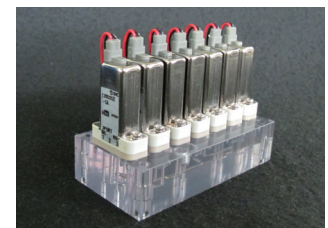
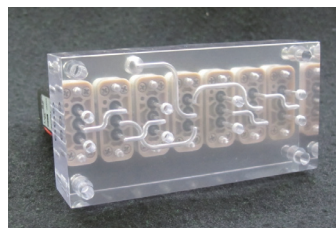
## IDG Membrane Air Dryer for Air Supply

- No electricity required dehumidification
- Dew points from  $-20^{\circ}\text{C}$  to  $-60^{\circ}\text{C}$
- No vibration or heat discharge



## Custom Manifolds and Engineered Subassemblies

- Bonded = Acrylic Resin, PVC, PEI (Ultem®), PSU
- Machined = PEEK, Aluminum, Stainless Steel, etc.



# Dental-Specific Air and Vacuum Production



## Air Preparation Units

### Desiccant and Refrigerated Air Dryers

### Fittings and Tubing

### Auto Drain and Vacuum Separator

### 2-port Valve for Air and Vacuum

## KQ2 Fitting and TIUB Tubing

- Fluid: air, water
- Applicable tubing O.D.: 1/8" to 1/2"
- Operating pressure range: -100 kPa to 1 MPa
- Release collar allows easy removal of tubing

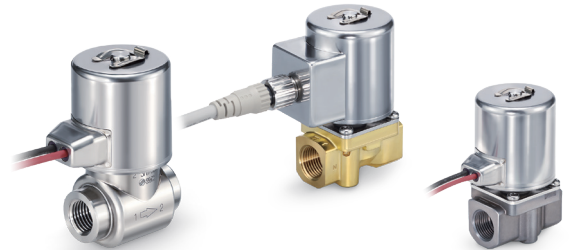
KQ2

TIUB



## JSX 2-port Valve

- 1/8" to 3/8" NPT, G, and Rc port
- UL, CE and NSF compliant
- NBR, FKM and EPDM seal material
- 360-degree coil rotation



## AD402-A, Auto Drain Valve

- Polycarbonate, nylon, or aluminum bowl
- 360° visibility of bowl contents
- Easy maintenance



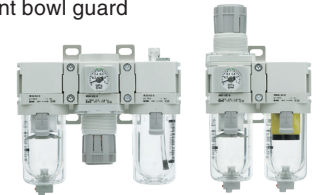
## Pressure and Vacuum Gages

- Red and green color zones for improved visibility
- Wide variety of port thread options
- Transparent bowl guard
- GP46 pressure gauge with built-in switch



## AC Air Prep Assembly for Air Supply

- Clean looking, urban white, modular design
- Energy saving with high flow rate
- Transparent bowl guard



## ID Heatless Air Dryer

- Compact and light weight
- Self-regenerative style allows for easy maintenance



## IDF Refrigerated Air Dryer

- Models for use in North America, Europe, Asia and Oceania
- 50/60 Hz operation



## AMJ Vacuum Drain Separator for Vacuum Pump

- Removes water droplets from intake of vacuum pumps
- Removes over 90% of droplets
- Almost no drop in pressure



## Decontamination and Lubrication of Tools



VXS2 and VXB Valves

JSX Stainless Steel Valve

High Purity Gas Equipment

High-purity / High-temperature Tubing and Fittings

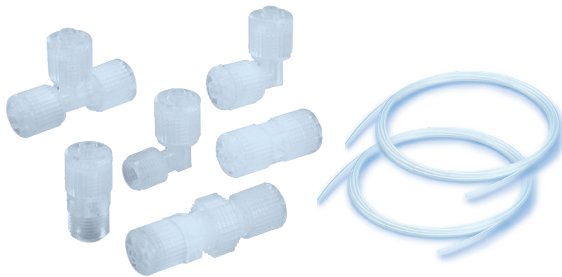
Fluoropolymer Tubing

Pinch Valve

Diaphragm Pumps

### LQ / TL Fluoropolymer Fittings and Tubing

- High purity and high chemical resistance
- Operating temperature: 0 to 150°C



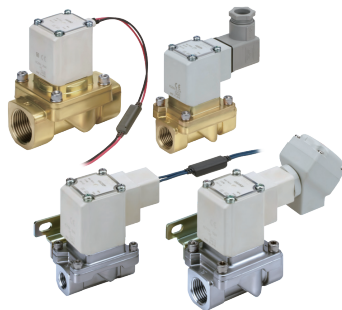
### JSX / JSXD 2-Port Valves

- Stainless steel body standard
- UL and CE compliant
- Enclosure up to IP67



### VXS2 2-port Steam Solenoid Valve

- Long service life: 3 million cycles
- Port size 1/4 to 1 inch
- IP65 Enclosure



### AP Tech High-purity Gas Valves and Regulators

- Suitable for UHP gas line supply line
- Body material: 316L SSs or brass
- Point of use and source cylinder applications





## Decontamination and Lubrication of Tools

### ISE70G High-precision Digital Pressure Switch

- Pressure ranges: 1, 2, 5 and 10 MPa
- 3-screen, 3-color display
- UL/CE/RoHS standards



### LPV Solenoid Pinch Valve

- Complete fluid isolation
- On/Off flow control through direct pinching of tubing
- U-shaped slot for easy tubing replacement

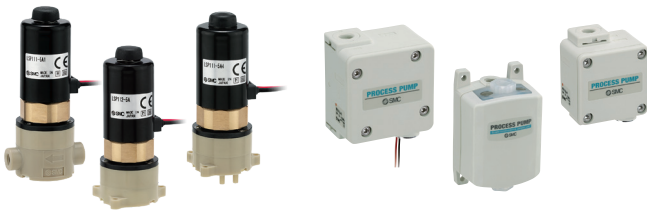


### LSP/PB Diaphragm Pumps

- Compact, diaphragm pump
- Solenoid or air operated type
- Long service life

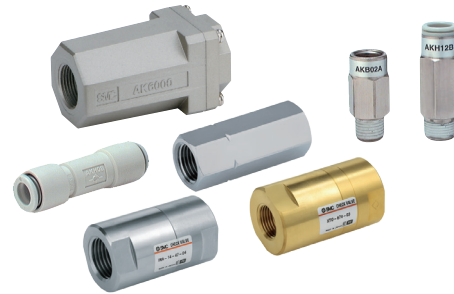
LSP

PB



### AK Check Valve

- Easily mounted onto equipment
- One-touch fittings built in
- Low cracking pressure (0.005 MPa)



### VXB Air-operated Angle Seat Valve

- For steam, air, and water
- Low leakage of 10 cm<sup>3</sup>/min or less
- Long service life: 3 million cycles





# Dental Lasers, Machining, and Aligner Manufacture



Temperature Control for Dental Laser

Electric Actuator

Solenoid Directional Valves

Digital Flow and Pressure Sensors (for chilled water)

Quick Couplers

Liquid Transfer Pump

Ionizer for Milling Machine

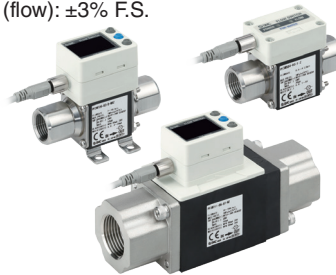
## IZG Gun Type Ionizer

- Lightweight: Only 200 g
- Easy to hold / grip
- Lighting LED
- Select from continuous or pulse blow



## PF3W7-Z Digital Flow and Temp Sensor

- Temperature range (°C): 0 to 90
- Accuracy (temperature):  $\pm 5\%$  F.S
- Accuracy (flow):  $\pm 3\%$  F.S.



## PA Diaphragm Pump

- Air-operated process pump
- Compact, large capacity
- Long life, easy maintenance



## JSY Directional Control Valve

- Space saving, with large flow rate
- Power saving down to 0.1 Watt
- Modular construction
- Variety of I/O options



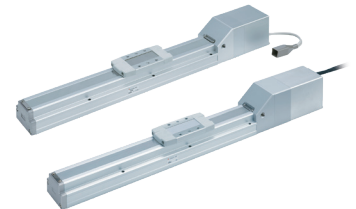
## INR-244-831 Miniature Chiller

- Compact, space saving
- Low-noise 45 dBA capable
- Set temp range: 10°C to 60°C
- Temperature stability  $\pm 0.01^\circ\text{C}$  to  $0.03^\circ\text{C}$



## LEFS Electric Actuator

- Positioning repeatability:  $\pm 0.02$  mm
- Maximum speed: 1500 mm/s
- incremental 17-bit or absolute 18-bit encoder



## KKA Coupler, Stainless Steel

- Body material: Stainless steel 304
- Seal material: Special FKM
- Grease-free specification (standard)

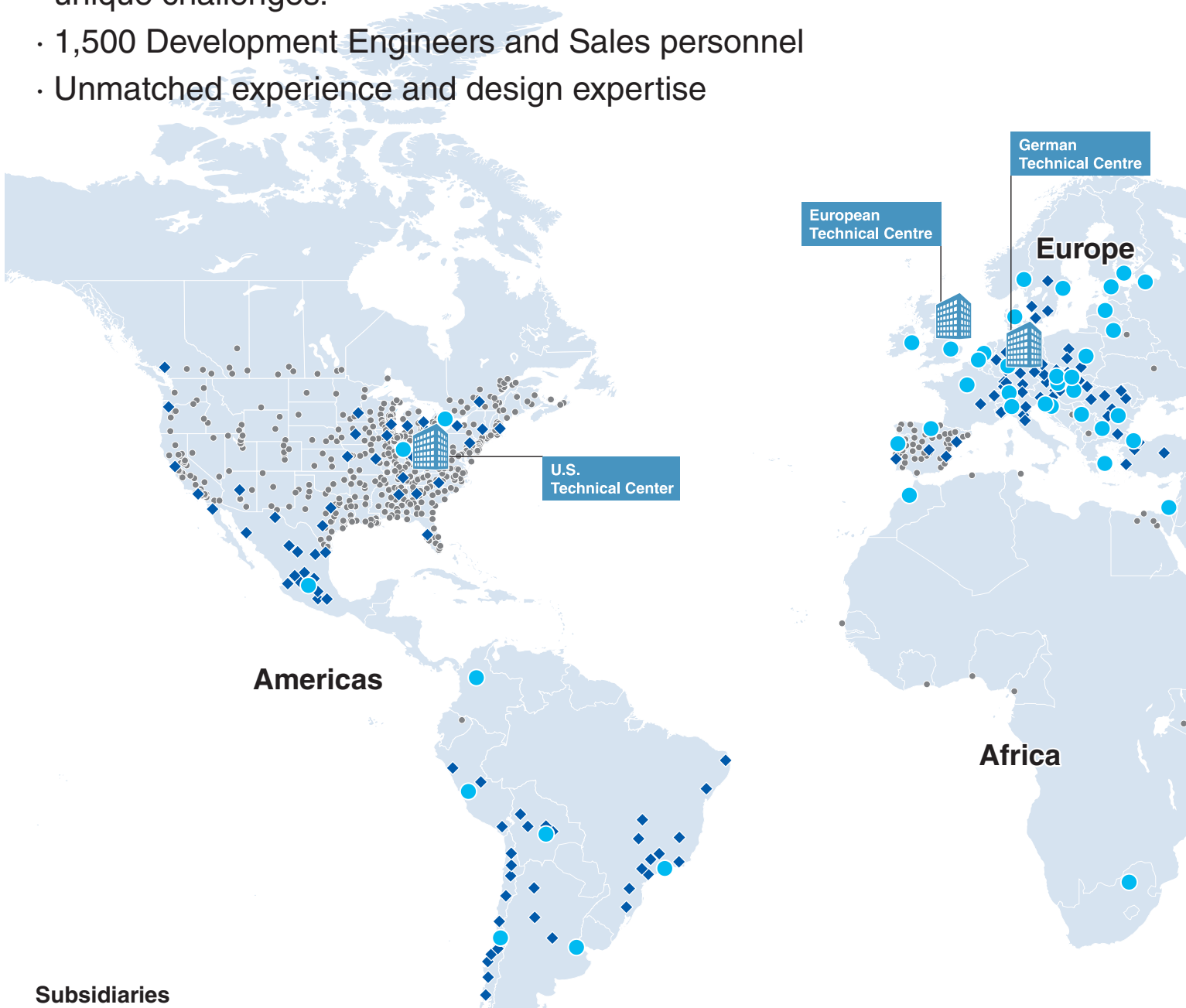


## VV061 Miniature Solenoid Valve Manifold

- Compact direct operated 3-port solenoid valve
- Unified air and electrical connections
- Dustproof enclosure



- Looking for a custom dental industry solution?  
Then look to SMC
- 5 technical centers around the globe dedicated to your local and unique challenges.
- 1,500 Development Engineers and Sales personnel
- Unmatched experience and design expertise



**Subsidiaries**

**Americas**

- ★ Argentina
- ★ Bolivia
- ★ Brazil
- ★ Canada
- ★ Chile
- ★ Colombia
- ★ Mexico
- ★ Peru
- ★ United States of America

**Europe/Africa**

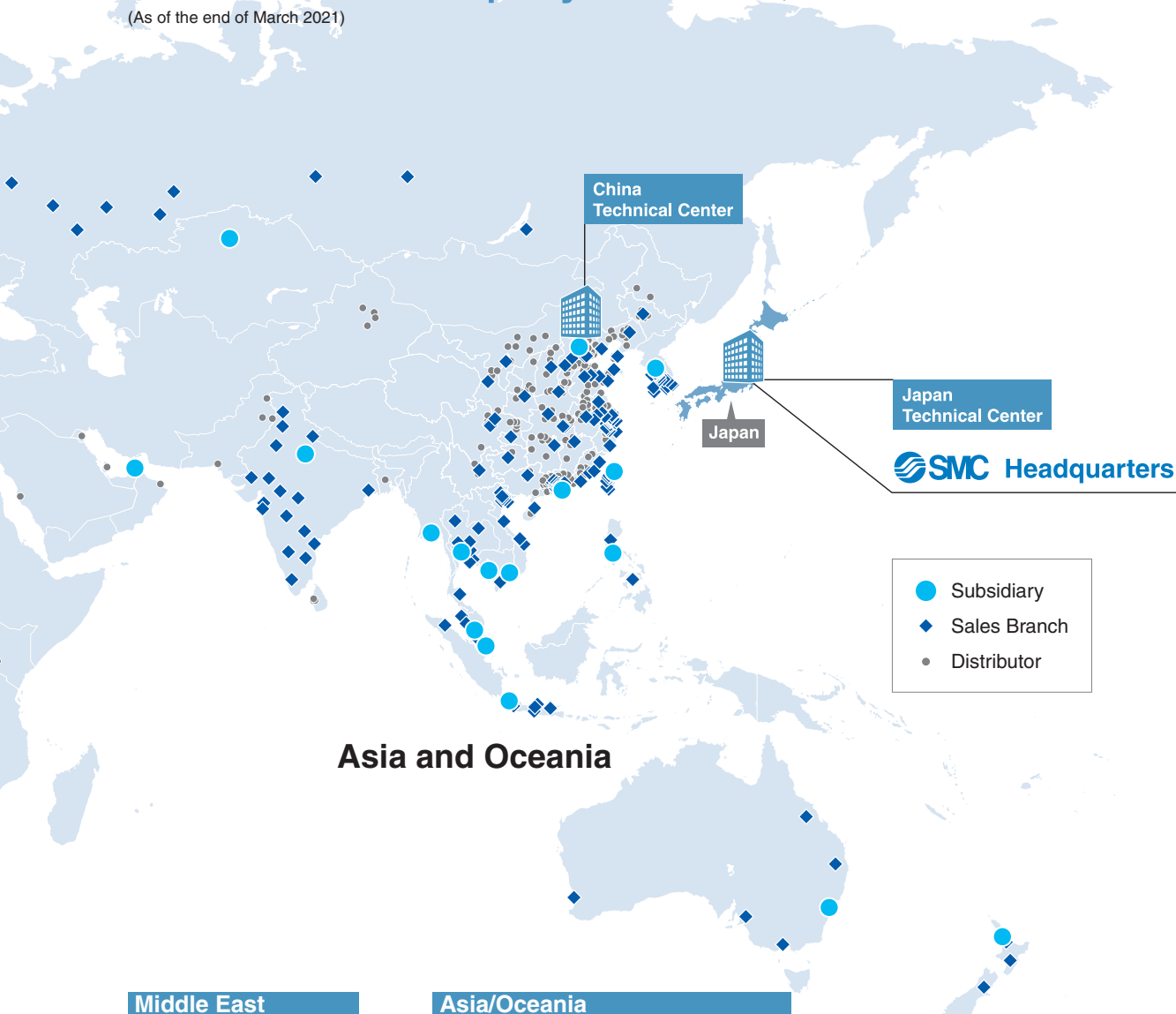
- ★ Austria
- ★ Belgium
- ★ Bulgaria
- ★ Croatia
- ★ Czech Republic
- ★ Denmark
- ★ Estonia
- ★ Finland
- ★ France
- ★ Germany
- ★ Greece
- ★ Hungary
- ★ Ireland
- ★ Italy
- ★ Kazakhstan
- ★ Latvia
- ★ Lithuania
- ★ Morocco
- ★ Netherlands
- ★ Norway
- ★ Poland
- ★ Portugal
- ★ Romania
- ★ Russia
- ★ Serbia
- ★ Slovakia
- ★ Slovenia
- ★ South Africa
- ★ Spain
- ★ Sweden
- ★ Switzerland
- ★ Turkey
- ★ United Kingdom

Local services in 532 locations  
across 83 countries and regions worldwide

Production facilities in 29 countries and regions

Number of employees: 20,619

(As of the end of March 2021)



#### Middle East

Israel  
United Arab Emirates

#### Asia/Oceania

★ Australia  
★ Cambodia  
★ China  
★ Hong Kong  
★ India  
★ Indonesia  
★ Korea

★ Malaysia  
★ Myanmar  
★ New Zealand  
★ Philippines  
★ Singapore  
★ Taiwan  
★ Thailand  
★ Vietnam

★ Production facility

\* The names of countries and regions listed in each area are alphabetically indexed.

\*\* This list only contains countries/regions with a wholly owned subsidiary.

# DENTAL INDUSTRY APPLICATIONS

SMC – Your automation partner for the dental industry

Find out what we can offer to meet your needs, at  
[www.smcusa.com/industries/life-science/dental-applications/](http://www.smcusa.com/industries/life-science/dental-applications/)



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