

# PRECISION MEASUREMENT SYSTEM

## SM701 / SM702 / SM703



### FIELD OF APPLICATION

High precision measurement of rotationally symmetrical parts. Commonly during the process of

- Production
- Quality control
- Incoming goods inspection
- Research

### MEASURING PRINCIPLE

- Optical measurement
- Fast and contactless
- Precise and reliable
- Automatic or manual

### BENEFITS

- Easy to use / fast set-up of new parts
- Time savings due to fast measurement result
- Automation eliminates operator error
- Extensive library of measurement functions
- Individual measurement reports
- Visualization of trends of measured characteristics
- Database and production control function included

### FUNCTIONALITY

- Measurement of outer contours of, for example, stamped, turned and formed parts
- Data import and export via network to integrated database or extern database / CAQ-System
- Device calibration by user is possible
- No exact positioning of measured parts necessary
- 360° scan and analysis within seconds

Technical specifications		SM701cp	SM701ec	SM701 / SM702 / SM703
General info	Size (WidthxHeightxDepth) [cm]	[45 ... 60] x [35 ... 50] x [20 ... 25]		[60 ... 75] x [50 ... 80] x [25 ... 30]
	Weight [kg]	20 ... 25	25 ... 30	30 ... 50
	Power supply	220 ... 240 VAC, 50 Hz ... 60 Hz, max. 2A (optional 110 VAC)		
	Location	Workshop, laboratory or office		
	Ambient Temperature [°C]	5 ... 40		
	Relative Humidity [%]	5 ... 95 non condensing		
Part size	Number of Cameras	1	1	1 to 3
	Maximum diameter [mm]	45	45	56
	Maximum length (one picture)	70	70	87
	Maximum travel [mm]	-	200	300
Accuracy	Typical thread size [mm]	M3 ... M20	M2 ... M20	M0.8 ... M25
	Accuracy (diameter)* [µm]	1,5	1,0	0,5
	Repeatability (diameter)* [µm]	1,1	0,8	0,5
	Accuracy (length)* [µm]	10,0	6,0	3,0
*values depend on optics used				
Including	Part loading	Clamping / Set of magnets and plates for non-magnetic parts (loose placing)		
	Computer and periphery	The system comes with current state of technology equipment.		
	Software license	SM-Software; developed together with companies of the fasteners industry		
	Warranty	2 years		
	Language	German, English, French, Spanish, Chinese, Turkish, Czech, ...		
Options	Set of calibration tools	Certified calibration tools with certificate by german institute		
	Delivery, Installation, Training	These services can be useful but are not necessary.		
	Maintenance and calibration	Maintenance and calibration can be performed by user or by ECM (annually).		
	Triangulation system (only SM703)	Additional triangulation components for underhead geometry measurement		

## MEASUREMENT CAPABILITY

Among other things, the precision measuring system can determine the following characteristic values:

### GEOMETRIC PARAMETERS AND SHAPES

Diameters, lengths, radii, angles, cones, spheres, etc.

### FORM AND POSITION TOLERANCES

Straightness, circularity, radial and axial runout, coaxiality, concentricity, cylindrical shape, symmetry, parallelism, squareness, perpendicularity, etc.

### THREAD MEASUREMENT

Standard thread, Trilobular thread, Taper thread, etc.

Depending on your application, you can choose from the following product variants. The achievable accuracies for the installed parts can be found in the table "OPTICS".



STANDARD DEVICES		Maximum diameter [mm]	Maximum length [mm]	Typical thread size	Linear unit for longitudinal movement	Glass scale for precise length measurement	Vacuum pump for non-magnetic parts	Triangulation system	Comment	
Product number										
SM	701	cp-33	33	46	M3 ... M14	-	-	-	-	Compact
		cp-45	45	70	M4 ... M20	-	-	-	-	Compact
		ec-33	33	250	M3 ... M14	Yes	-	-	-	Economic
		ec-45	45	250	M4 ... M20	Yes	-	-	-	Economic
		-33	33	250	M3 ... M14	Yes	Yes	Yes	-	Standard
	-45	45	350	M4 ... M20	Yes	Yes	Yes	-	Standard	
	702	-33-11	33	250	M1.2 ... M14	Yes	Yes	Yes	-	Standard
		-45-17	45	350	M2 ... M20	Yes	Yes	Yes	-	Standard
		-56-26	56	350	M2.5 ... M25	Yes	Yes	Yes	-	Standard
	703	-45-17-08	45	350	M0.8 ... M20	Yes	Yes	Yes	-	Universal
tr-45-17-45		45	350	M2 ... M20	Yes	Yes	Yes	Yes	Underhead	

**SM70X is a flexible and configurable product.** If the standard models mentioned above do not meet your requirements, it is possible to request special devices, for example, equipped with the following telecentric lenses and illuminators.

OPTICS	Measurement field size length x diameter [mm] (one picture)	Magnification (24" monitor)	Diameter		Length (one picture)		Length (travel)	
			Measurement accuracy [µm]	Repeatability [µm]	Measurement accuracy [µm]	Repeatability [µm]	Measurement accuracy [µm]	Repeatability [µm]
-08	12 x 8,5	42	± 0.5	± 0.5	± 3	± 1	± 6	± 2
-10	14 x 10	35	± 0.5	± 0.5	± 3	± 1	± 6	± 2
-11	17 x 11,5	29	± 0.5	± 0.5	± 3	± 1	± 6	± 2
-17	27 x 17	15	± 0.8	± 0.5	± 5	± 1.5	± 8	± 3
-26	37 x 26	10	± 0.8	± 0.5	± 5	± 1.5	± 8	± 3
-33	46 x 33	8	± 1.0	± 0.8	± 8	± 2	± 10	± 4
-39	62 x 39	7	± 1.5	± 1.0	± 8	± 2	± 12	± 5
-45	70 x 45	6	± 2.0	± 1.5	± 10	± 3	± 12	± 5
-56	87 x 56	5	± 2.0	± 1.5	± 10	± 3	± 15	± 6
-68	106 x 68	4	± 3.0	± 2.0	± 10	± 3	± 15	± 6
-85	132 x 85	3	± 4.0	± 2.0	± 15	± 5	± 20	± 7
ec-17	27 x 17	15	± 1.0	± 0.8	± 6	± 2	± 20	± 15
ec-33	46 x 33	8	± 1.5	± 1.0	± 10	± 3	± 25	± 15
ec-45	70 x 45	6	± 2.5	± 2.0	± 12	± 4	± 25	± 15
cp-33	46 x 33	8	± 1.5	± 1.1	± 10	± 3	-	-
cp-45	70 x 45	6	± 2.5	± 2.0	± 12	± 4	-	-