INNOVATIVE TEST & MEASUREMENT SYSTEMS

TECHNICAL DESCRIPTION

WATER TEST CHAMBER
SPK
R200 / R400 / R600 / R800

FULFILLED STANDARDS AND REGULATIONS - SPK SERIES

The iTS Water Test Chamber SPK series enables standard-compliant testing of "electrical equipment inside an enclosure" against effects of water ingress. The following standards and specifications for the area of "water testing" can be fulfilled. Special options are required depending on the test component or standard.

Standards	Standard	Optional	Option
IEC 60529:1989 + A1:1999 + A2:2013	x		
ISO 20653	x		
EN 60068-2-18	x		
IEC 60598-1	x		
LV 124	x		
BMW GS 95003-4	x		
SAE J575		x	SPK.OP-066 (12266) and others
JIS D203		x	SPK.OP-065 (11878) and others
UL 50E / NEMA 250		x	SPK.OP-032 (14712) and others

STANDARD SCOPE OF DELIVERY - SPK SERIES

The IP X3/4 tests are integrated in the standard version of the water test chamber. All the test types listed below can be integrated into the water test chamber as an option. This can also be done retrospectively on a later date.

The following protection type tests can be carried out in the Water Test Chamber SPK:

Protection type code	Type of examination	Scope of delivery
IP X1	Drip water	Option
IP X2	Drip water below 15°	Option
IP X3	Spray water	Standard - swivel tube not included (see accessories)
IP X4	Splash water	Standard - swivel tube not included (see accessories)
IP X4K	Splash water with increased pressure	Option

STANDARD SCOPE OF DELIVERY - SPK SERIES

Protection type code	Type of examination	Scope of delivery
IP X5	Water jets	Option
IP X6	Powerful water jets	Option
IP X6K	Water jets with increased pressure	Option
IP X9K	High pressure water test	Option
JIS D203 R1/R2 and S1/S2	Rain Test / Spray Test	Option
NEMA 4X / UL50E	Water jets / Rain test	Option / on request
SAE 575	Spray test	Option

Standard version SPK

The Water Test Chamber SPK is a self-contained system and can be easily positioned in the test room using the castors. After connecting the system, reproducible tests can be carried out again and again. The equipment required for this is housed in the test chamber or in the add-on tunnel.

The SPK enables the testing of all common test standards in ONE chamber. The equipment for IPX3/4 tests is included in the standard version. The chamber can be customised thanks to its modular design. Additional options for further tests can always be added at a later date.

All parts that come into contact with water are protected against corrosion. A large test chamber door facilitates the insertion of the test material - this is designed with a glass pane in a steel frame for observing the test process.

SPK R400 interior - standard version

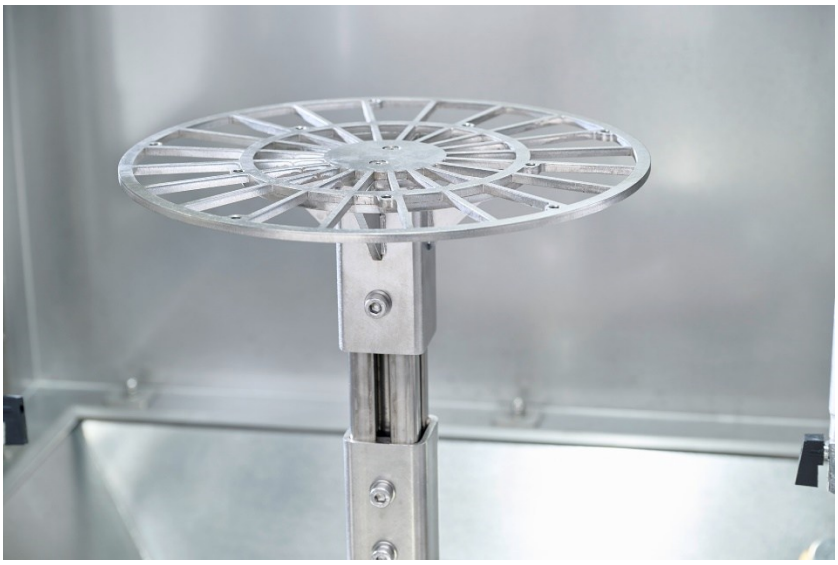
STANDARD SCOPE OF DELIVERY - SPK SERIES

SPK - Series	R200	R400	R600	R800
Internal test chamber W x D x H [mm]	960 x 960 x 900	1180 x 1180 x 1500	1500 x 1690 x 1500	2000 x 2000 x 2000
Door cut-out W x H [mm]	800 x 750	800 x 750	940 x 980 (front) 800 x 750 (side)	940x1800 (front) 940x1800 (side)
Number of doors with 1 windscreen wiper	2 over corner: front + left	2 over corner: front + right	2 over corner: front + right	2 over corner: front + right
Window size W x H [mm]	630 x 690	630 x 690	890 x 840 630 x 690	630 x 690 630 x 690
External width [mm]	1200 (+ 2300 mm with add-on tunnel for IPX5/6)	1600 (+ 2300 mm with add-on tunnel for IPX5/6)	1970 (+ 2300 mm with add-on tunnel for IPX5/6)	2500 (+ 2300 mm with add-on tunnel for IPX5/6)
External depth [mm]	1000 (+ 500 mm with IPX9K)	1200 (+ 500 mm with IPX9K)	1700 (+ 500 mm with IPX9K)	2000
External height [mm]	2100	2100	2100	2600
Turntable diameter [mm]	300	300	300	300
Max. Turntable load capacity [kg]	20	50	50	50
Test room lighting	Yes / LED	Yes / LED	Yes / LED	Yes / LED
Walk-on grate in the test room	-	-	available	available
Control panel position	right	left	left	left
Paintwork	Cladding panels: RAL 7035-light grey			
Stainless steel surfaces	polished look			
Weight [kg]	500	570	650	730

- **Note on weight: The weight refers to the standard version without additional attachments. Depending on the desired additional option, the weight may increase considerably due to the use of additional pumps, fixtures and, if necessary, add-on tunnels.**

Turntable

- **In the centre of the test chamber there is a height-adjustable turntable for holding the test specimen.**



Turntable support with height adjustment (illustration shows turntable from SPK R200)

- **The turntable is driven by a geared motor.**
- **The rotation speed is preselected on the control unit (1-5 rpm) or set automatically if test specifications are stored.**
- **The turntable can be operated in reversing mode. This is necessary for testing electrically operated DUTs to prevent the cable from unwinding and travelling.**

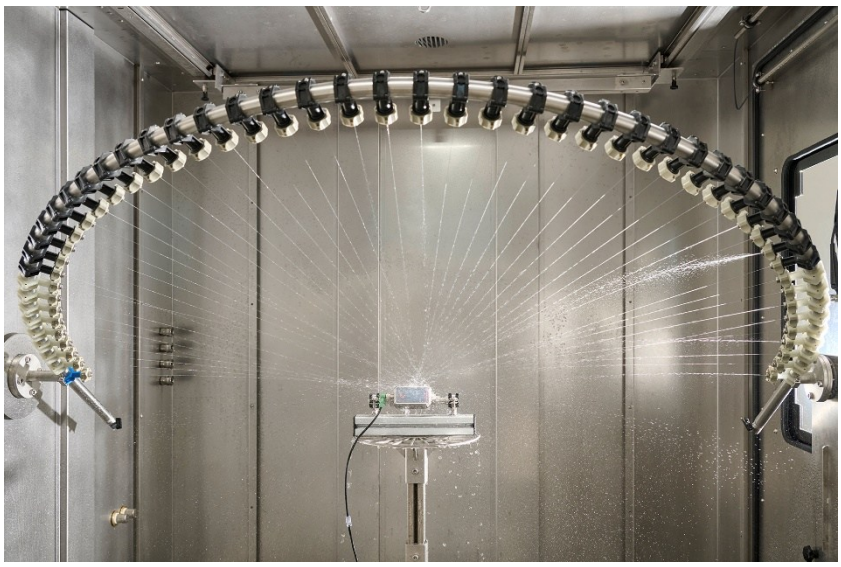
iTS turntable with castors (illustration shows turntable from SPK R600- with walk-on grate)

STANDARD SCOPE OF DELIVERY - SPK SERIES

Equipment for IP X3/X4 tests

- **The following functions are integrated for test operation with IP X3/4 swivel tubes:**
- **The swivel tube is driven by a geared motor. The corresponding drive unit and the pump unit for the water supply are installed outside the test room.**
- **The flow rate is set automatically via a control valve; in addition, a flow meter with a measuring range of 0-5 l/min records the flow rate.**
- **The water pressure is measured by a pressure sensor (0 - 6 bar).**
- **The iTS swivel tubes (see accessories) are mounted to the corresponding screw-on surfaces in the test area using flanges. Depending on the swivel tube size (R200 / R400 / R600 / R800), the axle length is adapted to the corresponding cabin size.**
- **For easy cleaning, the swivel tube can be flushed with compressed air at the touch of a button after each test.**

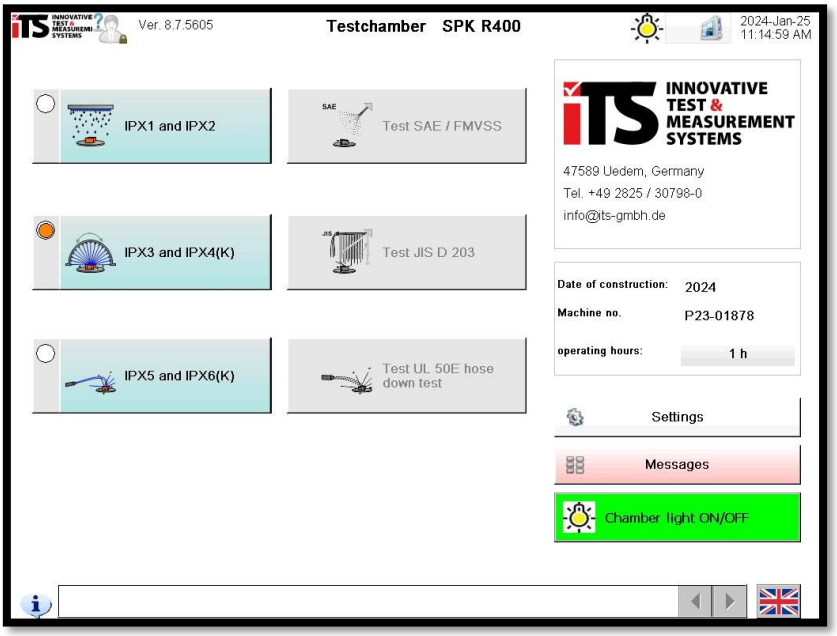
Please note: The swivel tubes are not included in the standard scope of delivery and must be ordered separately (see accessories), as these are chosen depending on the size of the test specimen in order to keep the standard distances.



R800 swivel tube in an SPKR800

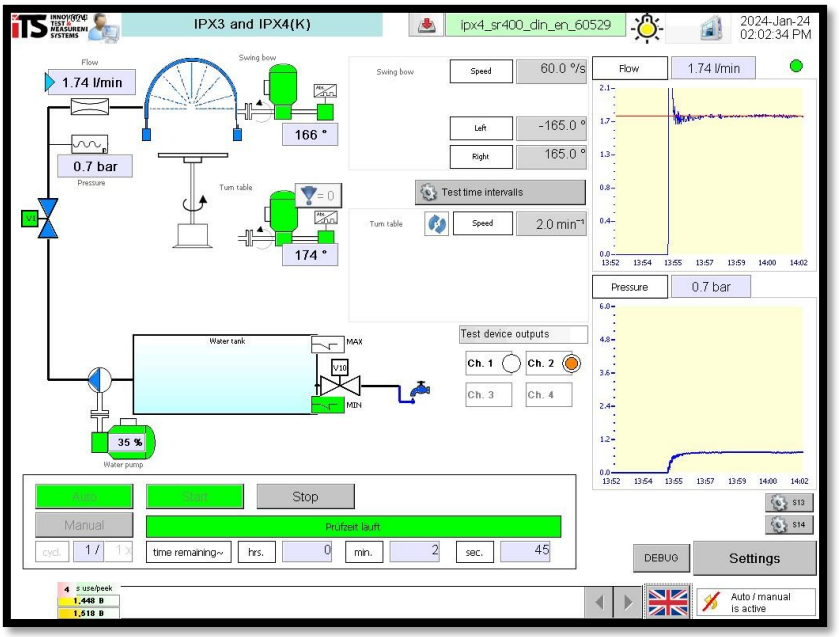
Control system

- **The Water Test Chambers of the SPK series are equipped with a PLC control system. All required test parameters are entered via a 15’ touch panel.**
- **Predefined parameter sets are available for tests in accordance with DIN EN ISO 60529, ISO 20653 and other common standards and automotive delivery specifications (standard-based test parameter sets cannot be changed) and can be selected directly on the start screen. The SPK can be operated in manual and automatic mode.**
- **The operator can compile their own customised tests at any time and save them as a new parameter set.**
- **The language can be switched via touch operation. The following languages are stored in the SPK control unit: German, English, French, Polish (other languages available on request).**
- **During a running test, pressure, temperature and flow values are displayed on the screen as numerical values and diagrams. It is possible to switch between flow control and control to a specific water pressure.**
- **If any error messages occur, they are shown in plain text on the display.**
- **Optionally, the data can be recorded and analysed with the iTS COMPANION APP.**

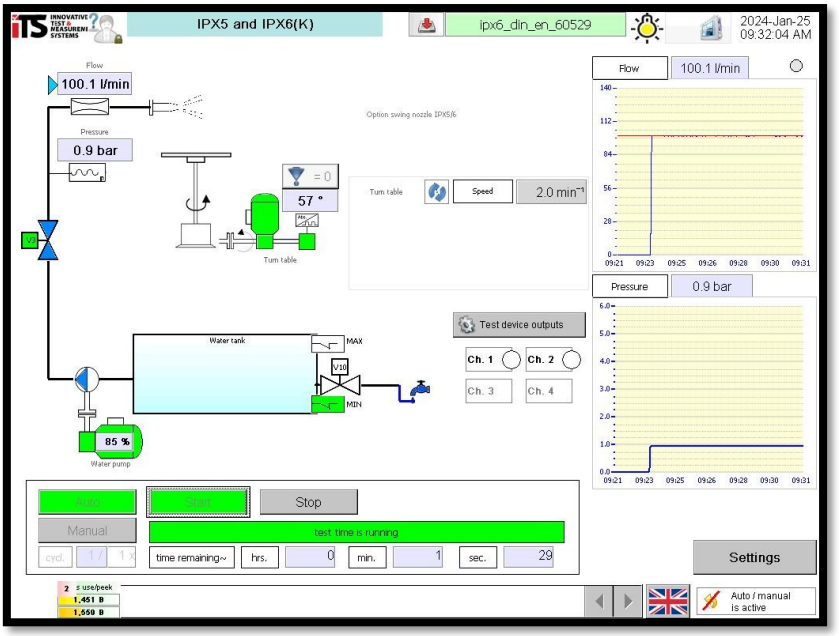


Start screen of the SPK series

STANDARD SCOPE OF DELIVERY - SPK USER INTERFACE



User interface with IPX3/4 testing in accordance with DIN EN ISO 60529



User interface with IPX5/6 testing in accordance with DIN EN ISO 60529

GENERAL REQUIREMENTS ON-SITE - SPK SERIES

Climatic conditions	SPK series
Ambient temperature [°C]	10 - 30
Relative humidity max. [%] - non-condensing	70

Electrical supply	SPK series
Electrical supply	3 x 400 Volt /50Hz N/PE
Power consumption up to [kW]	Standard (for IPX3/4 and also X5/6): 6 With IPX6K: 9 With IPX9K: 22
Installed load max. [A]	32
Electrical connection via	Direct wiring / connection via CEE plug
Ethernet (optional)	RJ 45 socket

- **Note: If connected via a CEE socket, this must be protected by a separate residual current device (RCD) of TYPE B (AC/DC sensitive).**

Compressed air supply	SPK series
Compressed air [bar]	3-6 5-6 (with the IPX9K option)
Compressed air quality	ISO 8573-1:2010 [3:3:4]
Compressed air connection	Via quick-release coupling NW 7.2

- **Note: The adapter for the connection is included in the scope of delivery.**

GENERAL REQUIREMENTS ON-SITE - SPK SERIES

Water supply	SPK series
Water quality	City water with a minimum conductivity of 30 µS/cm
Water filter (customer supplied) micronage [µm]	100
Water pressure max. [bar]	3
Water connection to system	Via hose nozzle for hose 13 mm inside
Max. water hardness [dH]	6

- **Note: The test water should never exceed a water hardness of 6°dH, especially for the IPX9K option, as this will result in increased limescale formation during heating. This increased limescale precipitation leads to a significantly shorter service life of the high-pressure pump and the heating elements in the hot water tank. To increase the service life of the nozzles and pumps, we recommend the use of demineralised water or a softening system (see options).**

Waste water connection	SPK series
Max. waste water temperature [°C]	20-30
Max. waste water temperature [°C] with IPX9K (option)	80-85
Interface	Hose nozzle NW 13

- **Note: The waste water is actively pumped (up to max. 1.3 m). Otherwise, the test chamber is emptied via a manual drain valve.**

All connections are located at the rear of the splash water chamber.

SPK R600 with connections in the lower area (here: network / supply line water / electricity / compressed air)

OVERVIEW: OPTIONS - SERIES SPK

Option number	Option	Checkbox	Only possible with another option
SPK.OP-010 (11871)	IPX1/IPX2 Dripping water box TG43	☐	
SPK.OP-011 (11872)	IPX1/IPX2 Dripping water box TG64	☐	
SPK.OP-013 (11874)	IPX1/IPX2 Dripping water box TG105	☐	
SPK.OP-014 (12576)	IPX1/IPX2 Dripping water box TG1010	☐	
SPK.OP-012 (12323)	Electronic flow meter for IPX1/X2	☐	
SPK.OP-015 (12283)	Automatic tilt table for IPX2	☐	
SPK.OP-020 (11873)	IPX4K Upgrade of the jet water	☐	Water circulation (SPK.OP-070)
SPK.OP-021 (14260)	Chamber without IPX3/X4 - retrofitable	☐	
SPK.OP-030 (11874)	IPX5/IPX6 Jet water in additional tunnel	☐	Water circulation (SPK.OP-070)
SPK.OP-031 (14705)	IPX5/IPX6 Jet water in additional tunnel XL	☐	Water circulation (SPK.OP-070)
SPK.OP-032 (14712)	Extension UL 50 Hose Down and NEMA 250 - 4	☐	IP X5/X6 Additional tunnel (SPK.OP-030/031) + Water circulation (SPK.OP-070)
SPK.OP-040 (11875)	IPX6K Water jets with increased pressure	☐	IP X5/X6 Additional tunnel (SPK.OP-030/031) + Water circulation (SPK.OP-070)
SPK.OP-050 (11876)	IPX9K High-pressure water jet with swivel lance	☐	Recommendation: Water softening unit (SPK.OP-700) + Steam suction (SPK.OP-080)
SPK.OP-060 (11877)	IPX9K High-pressure water jet with 4 fixed lances	☐	Recommendation: Water softening unit (SPK.OP-700) + Steam suction (SPK.OP-080)
SPK.OP-061 (12327)	Spraying device for cold cleaner	☐	
SPK.OP-070 (11879)	Water recirculation system	☐	

OVERVIEW: OPTIONS - SERIES SPK

Option number	Option	Checkbox	Only possible with another option
SPK.OP-071 (11949)	Water cooling unit for cold water tank	☐	
SPK.OP-072 (11950)	Temperature sensor for cold water tank	☐	
SPK.OP-080 (11880)	Steam suction	☐	Recommendation for IPX9K equipment
SPK.OP-065 (11878)	JIS test according to S1/S2 and R1/R2	☐	
SPK.OP-066 (12266)	SAE nozzle for the SAE 575 test	☐	
SPK.OP-067 (12278)	Flange connection Swivel elbow actuator	☐	
SPK.OP-090 (11881)	1-phase socket (in Water Test Chamber)	☐	Power supply via transformer after agreement
SPK.OP-120 (11884)	Additional entry port 100 mm	☐	
SPK.OP-121 (11885)	Additional entry port 150 mm	☐	
SPK.OP-122 (11886)	Additional entry port 200 mm	☐	
SPK.OP-123 (11887)	Additional entry port 250 mm	☐	
SPK.OP-200 (12284)	Data recording incl. iTS Companion App - Basic	☐	
SPK.OP-210 (11894)	Ethernet interface for data storing incl. iTS Companion App Pro	☐	
SPK.OP-212 (14755)	iTS Companion App - Pro Plus	☐	
SPK.OP-220 (12291)	Programmable digital channel	☐	
SPK.OP-224 (14756)	Additional programmable digital channel (2nd/3rd/4th channel)	☐☐☐	Digital Channel (SPK.OP-220)
SPK.OP-225 (14757)	Emergency stop switch-off of the water chamber from external	☐	
SPK.OP-226 (14758)	Safety signal of the water chamber for on-site control room	☐	
SPK.OP-600 (12264)	Flat spray nozzle DIN EN 60529 / ISO 20653	☐☐☐☐	
SPK.OP-601 (12263)	Force measurement of a flat spray nozzle according to DIN EN 60529 / ISO 20653	☐☐☐☐	Flat spray nozzle (SPK.OP-600)

OVERVIEW: OPTIONS - SERIES SPK

Option number	Option	Checkbox	Only possible with another option
SPK.OP-700 (12273)	Water softening unit	☐	Recommendation for IPX9K equipment
SPK.OP-132 (12274)	DAkkS calibration flow rate IP X1/X2	☐	
SPK.OP-130 (11888)	DAkkS calibration of sensors for IP X3/4	☐	
SPK.OP-140 (11889)	DAkkS calibration of sensors for IP X5/6	☐	
SPK.OP-150 (11890)	DAkkS calibration of sensors for IP X9K	☐	
SPK.OP-133 (12313)	DAkkS calibration of temperature sensor for cold water tank	☐	
SPK.OP-162 (12499)	Factory calibration flow rate IP X1/X2	☐	
SPK.OP-160 (11891)	Factory calibration of the sensors for IP X3/4	☐	
SPK.OP-170 (11892)	Factory calibration of the sensors for IP X5/6	☐	
SPK.OP-180 (11893)	Factory calibration of the sensors for IP X9K	☐	
SPK.OP-163 (14759)	Factory calibration of temperature sensor for cold water tank	☐	

The individual options are described below.

OPTIONS - SPK SERIES

SPK.OP-010 (11871) - SPK.OP-011 (11872) - SPK.OP-013 (12575) - SPK.OP-014 (12576) - IPX1/IPX2 Dripping water box TG

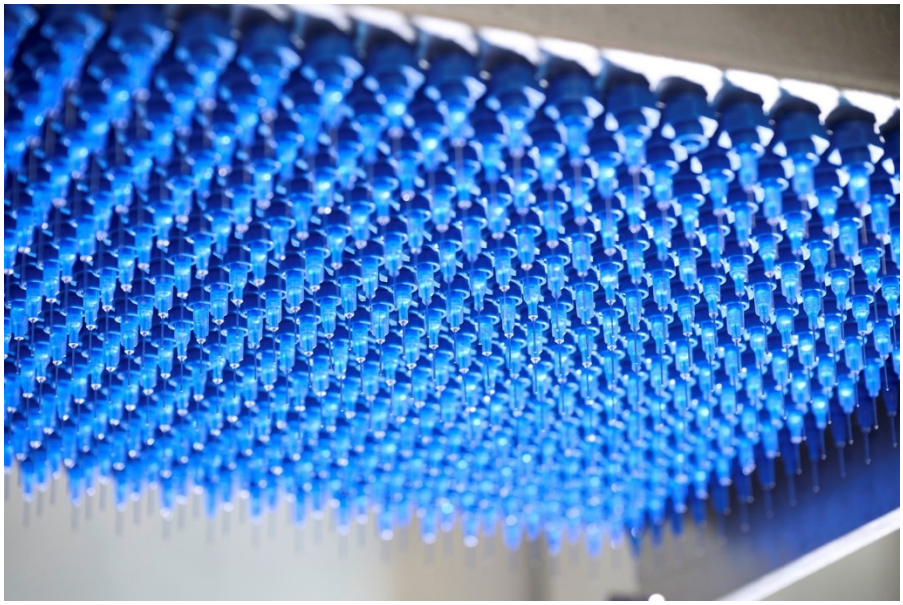
- **The dripping water box (TG) consists of a stainless-steel housing. This is attached to the test room ceiling of the SPK using hooks.**
- **The drip nozzles are arranged in a grid of 20x20mm and have a diameter of 0.4 mm. The drip nozzles are stainless steel tubes with an effective length of 15 mm and a bayonet lock at the upper end, which is used to attach them to the dripping water box.**
- **Thanks to this bayonet lock, the "nozzles" are easy to replace. The dripping water box does not need to be opened. This means that a blocked tube can be replaced even when the tray is full.**
- **The drip rate can be adjusted using a flow regulator.**

SPK - Dripping water boxes	Drip area (mm x mm)	Number of drip nozzles
TG 43 (SPK.OP-010 (11871))	400 x 300	336
TG 64 (SPK.OP-011 (11872))	600 x 400	600
TG 105 (SPK.OP-013 (12575))	1000 x 500	1250
TG 1010 (SPK.OP-014 (12576))	1000 x 1000	2500

Dripping water box TG 64 in SPK R600

OPTIONS FOR SPK SERIES

SPK - Dripping water boxes	Use in SPK R200	Use in SPK R400	Use in SPK R600	Use in SPK R800
TG 43 (SPK.OP-010 (11871))	Yes	Yes	Yes	Yes
TG 64 (SPK.OP-011 (11872))	Yes	Yes	Yes	Yes
TG 105 (SPK.OP-013 (12575))	-	-	Yes	Yes
TG 1010 (SPK.OP-014 (12576)	-	-	-	Yes



TG 64 drip nozzles in detail

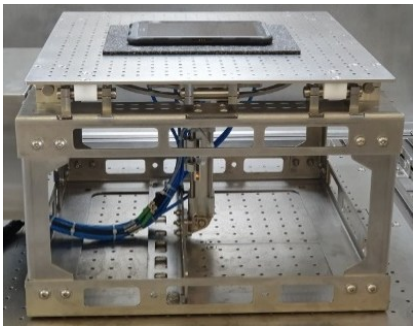
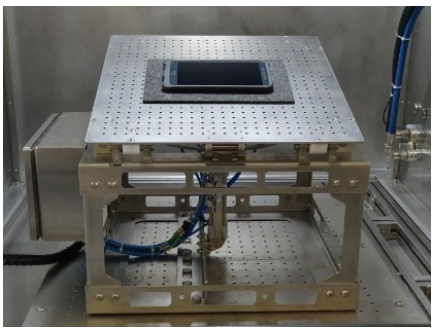
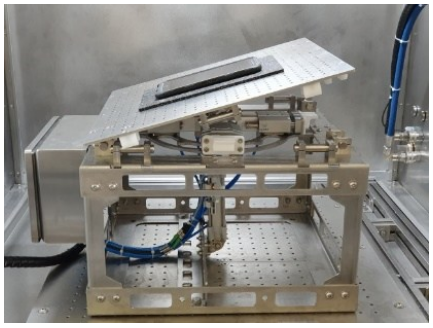
SPK.OP-012 (12323) - Electronic flow meter for IPX1/X2

- **The flow rate is measured electronically instead of using a flow meter with a float. The flow rate is still set manually.**

OPTIONS FOR SPK SERIES

SPK.OP-015 (12283) - Automatic tilt table for IPX2

- **The table tilts automatically 15° in all 4 directions.**
- **An IPX2 test can thus be carried out fully automatically because the position of the DUT does not have to be changed manually by the operator.**
- **The duration of the IPX2 test can be set separately for each tilting position.**
- **The platform of the tilt table has a size of 500 x 500 mm**
- **This platform has M6 threads with a grid of 25 x 25 mm, to which the DUT can simply attached to the platform.**

SPK.OP-020 (11873) - IPX4K Upgrade of the jet water

- **Increase the water flow rate for the swivel tube for max. 25l/min at 6 bar.**
- **Extension of the measuring range for flow measurement to 0-25 l/min.**
- **Nozzle set for a swivel tube, suitable for all swivel tubes from iTS for converting an IP X3/4 swivel tube to IP X4K.**

Note: This option requires a water circulation system (SPK.OP-070 (11879)) and a separately ordered swivel tube (SPK.ZB-010 - SPK.ZB-040 (11896 - 11899)).

SPK.OP-021 (14260) - Chamber without IPX3/X4 - retrofitable

- **The water test chamber is built without the equipment for IPX3/X4 tests, which is included in the standard scope of delivery.**
- **This option can be retrofitted later, if IPX3/X4 tests are to be carried out in the SPK.**

SPK.OP-030 (11874) - IPX5/X6 Jet water in additional tunnel

- **For the IP X5/X6 test, the distance to the DUT must be 2.5 to 3 metres. For this purpose, a corresponding tunnel is flange-mounted to the chamber through the side test chamber door. With the SPK R200, the side test chamber door is located on the left-hand side, from size SPK R400 onwards on the right-hand side.**
- **The two jet nozzles (6.3 mm and 12.5 mm diameter nozzle in accordance with DIN 60529) are supplied with water from the test chamber. The attachment tunnel can be quickly connected via a prepared water connection on the outside of the SPK.**
- **The corresponding valves are switched by the control unit for this purpose.**
- **The flow rate is controlled by a centrifugal pump, whereby the flow rate is determined by a magnetic inductive flow meter (measuring range 0-106 l/min).**
- **A pressure sensor measures the water pressure (measuring range 0-1.6 bar).**

Note: This option requires a water circulation system (SPK.OP-070 (11879).

SPK R800 with additional tunnel for IPX5/6 tests

Jet water

OPTIONS FOR SPK SERIES

SPK.OP-031 (14705) - IPX5/X6 Jet water in additional tunnel XL

- **For the IP X5/X6 test, the distance to the DUT must be 2.5 to 3 metres. The additional tunnel XL is flange-mounted to the SPK R800 through the test chamber door. This option is only available for the chamber size SPK R800.**
- **Aligning the jet water to the DUT, which may be large, is easier and more convenient thanks to the additional tunnel XL.**

SPK R800 with additional tunnel XL and UL 50 hose down equipment

- **The two jet nozzles (6.3 mm and 12.5 mm diameter nozzle in accordance with DIN 60529) are supplied with water from the test chamber. The attachment tunnel can be quickly connected via a prepared water connection on the outside of the SPK.**
- **The corresponding valves are switched by the control unit for this purpose.**
- **The flow rate is controlled by a centrifugal pump, whereby the flow rate is determined by a magnetic inductive flow meter (measuring range 0-106 l/min).**
- **A pressure sensor measures the water pressure (measuring range 0-1.6 bar).**

Note: This option for the SPK R800 requires a water circulation system (SPK.OP-070 (11879).

UL 50 Hose Down test

SPK.OP-032 (14712) - Extension UL 50 Hose Down and NEMA 250 - 4

- **For tests in accordance with UL 50 Hose Down and Nema 250 - 4, a reinforced pump (240 litres), an additional nozzle and a flow meter with a larger range are used.**

Note: This option requires the IP X5/X6 option (SPK.OP-030/031) and the water circulation option (SPK.OP-070) to be ordered.

View through the additional tunnel XL with UL Hose Down equipment

SPK.OP-040 (11875) - IPX6K Jet water with increased pressure

- **With this option, the 75 litres/min required by the DIN 40050 Part 9 / ISO 20653 standard can be conveyed through the nozzle with a diameter of 6.3 mm at a pressure of 10-12 bar.**
- **For this purpose, the IP X5/X6 option (SPK.OP-30 or SPK.OP-031) is extended so that the water pump can deliver a maximum volume of 100 l/min at 10 bar.**
- **The measuring range of the pressure sensor is increased from 1.6 bar to 16 bar.**

View through the additional tunnel

Note: This option requires the IP X5/X6 option (SPK.OP-030/031) and the water circulation option (SPK.OP-070)) to be ordered.

SPK.OP-050 (11876) - IPX9K High pressure water jet with swivel lance

- **The high-pressure lance in accordance with ISO 20653 and DIN EN 60529 for IP X9K is attached to a swivel arm for position approach. This option includes a set of measured nozzles in accordance with DIN EN 60529.**
- **The swivel arm is flanged to the swivel drive of the swivel tube (see IPX3/4) (there is no separate drive for this lance). The set-up time between an IPX3/4 test and an IPX9K test is approx. 5 min.**
- **The high-pressure lance moves to the test position (0, 30, 60, 90°) and sprays the DUT according to the set duration. Settings for spray angle, water temperature, water pressure and spray duration can be preselected via the control unit. The values are shown as a numerical value and as a diagram on the display.**
- **A stainless-steel tank holding approx. 140 litres of water with electric resistance heating (approx. 15 kW) is used to generate hot water. The heating phase of the test water takes approx. 30 minutes.**
- **The pre-pressure for the high-pressure pump is generated by a pre-pressure pump. The high-pressure pump is controlled by a frequency converter**
- **The flow rate is determined by a magnetic inductive flow meter (measuring range 0 – 25 l/min). A pressure sensor measures the water pressure (measuring range 0-160 bar) and the water temperature is measured near the nozzle (measuring range 0-100°C).**
- **The hot water is used in the circuit. This enables long test times.**

Swivelling lance for IPX9K

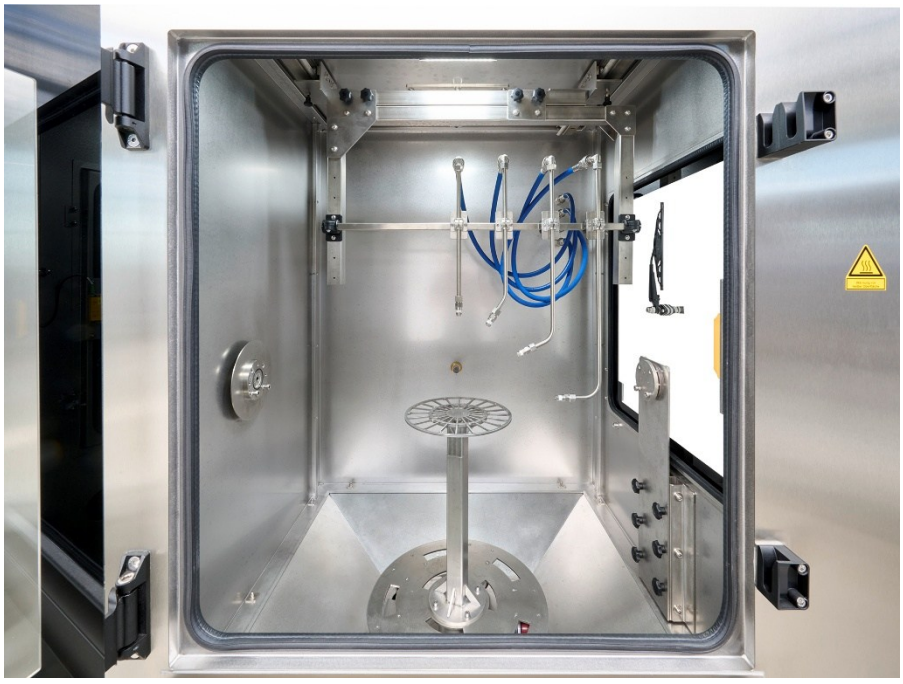
- **If the water temperature falls below the set value during a test, the system automatically goes into a short pause during which the water is reheated. Once the set temperature is reached again, the test continues.**

Note: The test water for this test should not exceed a water hardness of 6°dH under any circumstances, as otherwise increased limescale precipitation will occur during heating. This in turn leads to a significantly shorter service life of the high-pressure pump and the heating elements in the hot water cylinder. If the water is hard, a water softening system should therefore be installed (SPK.OP-700).

Vapour extraction is also recommended to remove water vapour from the test chamber using a fan (SPK.OP-080).

SPK.OP-060 (11877) - IPX9K High pressure water jet with 4 fixed lances

- **The 4 high-pressure lances in accordance with ISO 20653 and DIN EN 60529 for the IP X9K test are mounted on a frame. This option includes a set of measured nozzles in accordance with DIN EN 60529.**
- **The frame with the lances is mounted in the chamber and is pulled up and locked in place for the test via rails on the chamber ceiling. This minimises set-up times. The individual lances can also be aligned on the crossbeam and adjusted in height.**



IPX9K high-pressure lances in an SPK R400

- **The 4 high-pressure lances are switched in sequence by the control unit. Settings for spray angle, water temperature, water pressure and spray duration can be preselected via the control unit. The values are shown as a numerical value and as a diagram on the display.**
- **A stainless-steel tank holding approx. 140 litres of water with electric resistance heating (approx. 15 kW) is used to generate hot water. The heating phase of the test water takes approx. 30 minutes.**

- **The pre-pressure for the high-pressure pump is generated by a pre-pressure pump. The high-pressure pump is controlled by a frequency converter**
- **The flow rate is determined by a magnetic inductive flow meter (measuring range 0 - 25 l/min). A pressure sensor measures the water pressure (measuring range 0-160 bar) and the water temperature is measured near the nozzle (measuring range 0-100°C).**
- **The hot water is used in the circuit. This enables long test times.**

Note: The test water for this test should not exceed a water hardness of 6°dH under any circumstances, as otherwise increased limescale precipitation will occur during heating. This in turn leads to a significantly shorter service life of the high-pressure pump and the heating elements in the hot water cylinder. A water softening unit should therefore be installed if the water is hard (SPK-OP.700).

Steam suction is also recommended to remove water steam from the test chamber using a fan (SPK.OP-080).

IPX9K test

SPK.OP-061 (12327) – Spraying device for cold cleaner

- **Spraying device in the chamber for automatic spraying of the DUT - the DUT can be rotated during automatic spraying.**
- **The corresponding storage container has a capacity of 15 litres.**
- **It can be integrated / programmed into the sequence of an IPX9K test.**

Note: When cold cleaning device is introduced, the system automatically switches to waste water mode.

OPTIONS FOR SPK SERIES

SPK.OP-070 (11879) - Water circulation system

- **This tank is used to supply all tests with "cold" water (depending on options IPX1/2, IPX3/, IPX 5/6, JIS) in order to reduce water consumption.**
- **A water tank (approx. 120 litres) is installed under the test chamber. This can be completely emptied using a drain tap.**
- **A UV lamp is integrated into the circuit to prevent algae formation. The water is cycled through this UV lamp. The UV lamp kills possible germs and thus prevents the formation of algae.**

Note: The test water must be replaced every 2-3 months despite UV treatment.

SPK.OP-071 (11949) - Water cooling unit for the cold water tank

- **Water cooling unit for the cold water tank (from SPK.OP-070) to cool down the water temperature.**
- **The water can heat up due to long test times (e.g. with IPX4K), high water pressure or heat from test specimens (e.g. headlights) and then no longer fulfil the required temperatures according to the standard.**
- **Cooling is provided by a heat exchanger and an air-cooled unit.**
- **The temperature range extends from room temperature to a minimum of 10°C.**

SPK.OP-072 (11950) - Temperature measurement for IPX1-IPX6 and JIS tests

- **A temperature measurement is installed in the outlet of the cold water tank. The measuring range of the measuring point is 0 - 100°C.**
- **The measurement can be used to prove that the water corresponds to the required temperature of 20°C +/-5°C.**

SPK.OP-080 (11880) – Steam suction

- **An exhaust fan is installed in the roof of the water spray chamber to remove water steam from the test room.**
- **The exhaust air fan generates a volume flow of 230m³/h and must be connected to a DN 100 exhaust air pipe on site. The maximum length of the exhaust air pipe must not exceed 10 metres.**
- **The fan is integrated into the control system of the splash water chamber, e.g. the fan starts automatically when an IPX9K test is started.**
- **A follow-up time can be set in the operating software so that the exhaust fan clears the test chamber of vapour at the end of the test.**

Note: This vapour extraction system is recommended for the IPX9K option.

OPTIONS FOR SPK SERIES

SPK.OP-065 (11878) - JIS test according to D0203 S1/S2 and R1/R2

- **An additional drive is installed in the chamber for testing in accordance with JIS D0203. The drive's axis of rotation has a 45° inclination in accordance with JIS D0203.**
- **The maximum rotation speed of this axis is 23 rpm. The turntable drive motor is modified so that a maximum rotation of 17 rpm (as required by JIS D0203) can be achieved. The turntable can then be operated in the range of 1-17 rpm.**
- **The nozzles for the S1/S2 and R1/R2 tests are included in the scope of delivery.**

S1 / S2

R1 /R2

SPK.OP-066 (12266) - SAE nozzle for the SAE J575 test

- **This option includes a test nozzle for SAE J575 with a cone spray pattern and integration of the test in the control unit. The nozzle is mounted in the chamber at an angle of 45°.**
- **The flow rate for operation can be set on the control panel.**
- **The distance between the nozzle and DUT can be adjusted**

SAE nozzle in SPK

OPTIONS FOR SPK SERIES

SPK.OP-067 (12278) - Flange connection for swivelling drive

- **Flange connection for supplying water to external devices via the swivel tube connection point (e.g. spray nozzle) using a GEKA coupling.**

SPK.OP-090 (11881) - 1-phase test room socket outlet

- **A single-phase socket is installed in the test room to supply the test specimen. The switching times of the socket can be programmed via the system's control unit.**
- **Socket type: Industrial plug HC-B06 with adapter CEE 16A - 230V - 2-pole - PE (blue) - IP67 / Adapter and plug are included in the scope of delivery. (see photo)**
- **The power supply and fuse protection of the socket is provided externally via an industrial plug HC-B06 in the front of the dust chamber (plug included in the scope of delivery).**
- **Without this feed, the socket is potential-free.**
- **For safety reasons, the socket outlet should be supplied via an on-site isolating transformer.**

Note: On request, the power supply for the socket outlet can be supplied with an isolating transformer. However, the solutions for this must always be agreed separately.

OPTIONS FOR SPK SERIES

SPK.OP-120 (11884) - Additional entry port 100 mm

- **A 100 mm entry port is installed in the side wall of the test room.**
- **The entry port is supplied with a suitable rubber plug.**

SPK.OP-121 (11885) - Additional entry port 150 mm

- **A 150 mm entry port is installed in the side wall of the test room.**
- **The entry port is supplied with a suitable rubber plug.**

SPK.OP-122 (11886) - Additional entry port 200 mm

- **A 200 mm entry port is installed in the side wall of the test room.**
- **The entry port is supplied with a suitable rubber plug.**

SPK.OP-123 (11887) - Additional entry port 250 mm

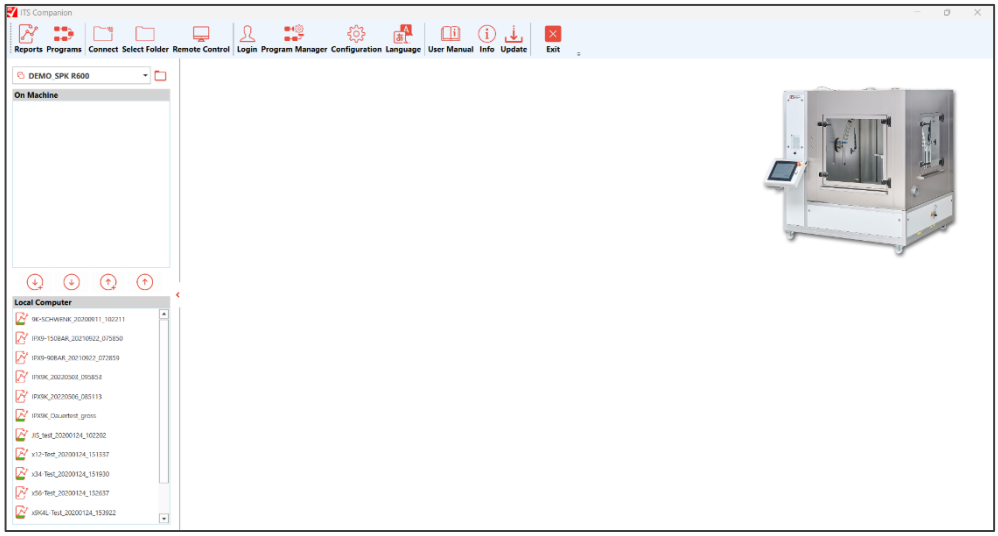
- **A 250 mm entry port is installed in the side wall of the test room.**
- **The entry port is supplied with a suitable rubber plug.**

SPK.OP-200 (12284) - Data recording incl. iTS Companion App - Basic

- **All relevant measured values and parameters are recorded in a CSV file.**
- **The data is downloaded from the control panel via a USB interface.**
- **The iTS Companion App-Basic is included in the scope of delivery.**
- **With the iTS Companion App Basic, the CSV data can be analysed and automatically displayed in a test report.**
- **The user interface as well as the reports are available in German/English and can be switched.**

Note: A demo version can be downloaded from the following link:

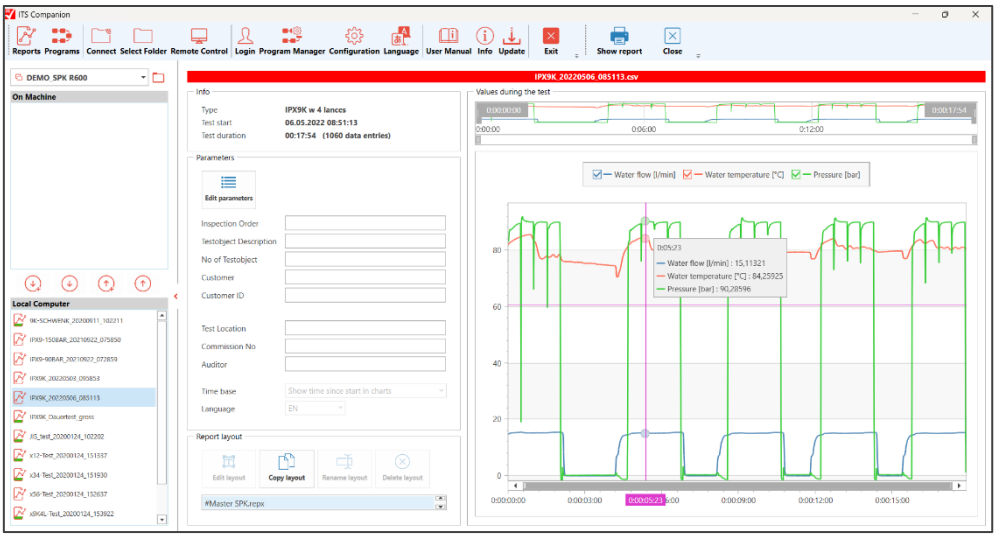
https://its-gmbh.de/wp-content/companion-app/ITS-Companion-v3-Install.zip



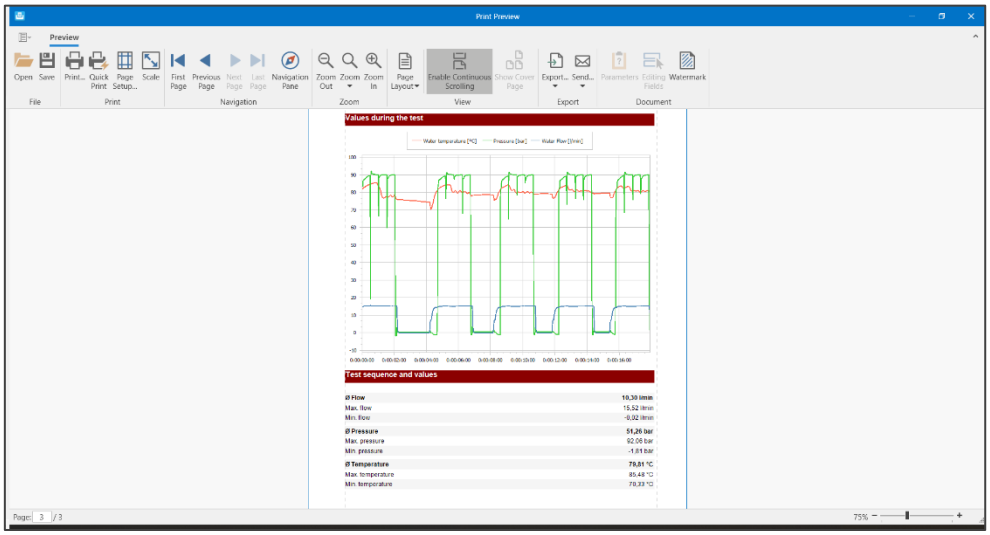
Start screen - iTS Companion App

SPK.OP-210 (11894) - Ethernet interface for data recording incl. iTS Companion App- Pro

- **The iTS Companion App-Pro includes all the functions of the iTS Companion App-Basic.**
- **An Ethernet interface enables the chamber to be integrated into a customer network.**
- **The Ethernet interface is also designed as an RJ45 socket on the rear of the chamber**
- **The interface can be used with a fixed IP address or DHCP.**
- **iTS Companion App Pro with the following additional functions compared to BASIC:**
  - **Transmission of recorded data via Ethernet interface**
  - **Creation, organisation and transfer of test programmes**
  - **Remote connection via VNC for monitoring the test chamber**
  - **Remote connection via VNC to control the test chamber**



Test procedure - iTS Companion App



Standard report - iTS Companion App

SPK.OP-212 (14755) - iTS Companion App- Pro Plus

- **All the functions of the Basic/Pro version are retained, and an editor is also activated with which all reports can be customised by the customer.**
- **This is a one-off, time-unlimited activation for all iTS Companion App workstations in the company.**

Note: Only in conjunction with an iTS Companion Pro licence.

SPK.OP-220 (11895) - Programmable digital channel (1st channel)

- **1. digital channel in a DO box, e.g. for the control/supply of a DUT, is designed as a potential-free NO contact.**
- **The channel can be switched synchronously with the test cycles.**
- **Each system can be equipped with a maximum of 4 channels (see SPK.OP-224).**
- **The maximum load capacity of the channel is 230V / 5A (AC1).**
- **Interface: Standard 4mm laboratory/banana socket.**

SPK.OP-224 (14756) - Additional programmable digital channel (2/3/4. channel)

- **1 additional control contact with a maximum load capacity of 230V / 5A (AC1) is designed as a potential-free NO contact.**
- **Max. 3 additional channels are possible (4 in total with SPK.OP-220)**

SPK.OP-225 (14757) - Emergency-stop switch-off of the water spray chamber from outside

- **For switching off the test chamber/system by a safety device provided by the customer using two potential-free contacts (2-channel switch-off).**
- **Interface: Standard 4mm laboratory/banana socket**

SPK.OP-226 (14758) - Water Test Chamber SPK safety signal for on-site control room

- **Integration of 2 potential-free contacts for signalling EMERGENCY stop or door open to the on-site control system, e.g. to switch off an on-site DUT supply when the chamber door is opened.**
- **Interface: Standard 4mm laboratory/banana socket.**

SPK.OP-600 (12264) - Flat spray nozzle to DIN EN 60529 / ISO 20653

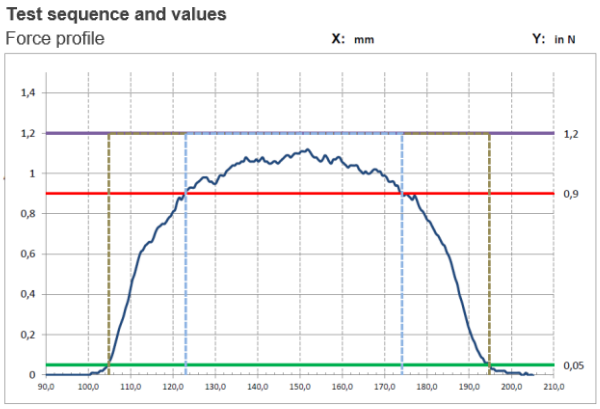
- **A high-pressure flat spray nozzle in accordance with DIN EN 60529 and ISO 20653 for IPX9K tests for installation in an iTS test lance.**

Note: Please specify the required quantity when ordering.

SPK.OP-601 (12263) - Force profile measurement of a flat spray nozzle according to DIN EN 60529 / ISO 20653

- **Measurement of a nozzle using a force progression diagram in accordance with DIN EN 60529 for the flat spray nozzle, whereby the nozzle to be measured must be ordered separately (SPK-OP.600). A corresponding protocol is provided.**
- **The SPK.OP-50 and OP-60 options already include a set of measured nozzles.**

Note: Please specify the required quantity when ordering.



OPTIONS - SPK SERIES

SPK.OP-700 (12273) - Water softening unit

- **A water softening unit is required if the city water has a hardness of >6°dH. Among other things, the use of the system prevents nozzles from becoming blocked by limescale and increases the service life of pumps.**
- **The scope of delivery includes a volume/computer-controlled individual softener pre-assembled on a frame with the following features:**
    - **Capacity at 10°dH 6000 litres - at 15°dH 4500 litres - at 20°dH 3000 litres, water consumption per regeneration approx. 72 litres,**
    - **Connection block with bypass function and blending device, sampling valve**
    - **25kg regenerating salt in tablet form**

Note: Necessary power supply on site: 1Ph / 1N / PE / 230V - 50Hz.

SPK.OP-132 (12274) - DAkkS calibration flow rate IPX1/X2

- **DAkkS calibration by a certified company incl. test certificate for the flow meter of the IP X1/2 test.**

SPK.OP-130 (11888) - DAkkS calibration of sensors for IPX3/X4

- **DAkkS calibration by a certified company incl. test certificate for the flow meter and pressure sensor of the IPX3/4 test.**

SPK.OP-140 (11889) - DAkkS calibration of sensors for IPX5/X6

- **DAkkS calibration by a certified company incl. test certificate for the flow meter and pressure sensor of the IP X5/6 test.**

SPK.OP-150 (11890) - DAkkS calibration of sensors for IPX9K

- **DAkkS calibration by a certified company incl. test certificate for the flow meter, pressure sensor and temperature sensor of the IP X9K test.**

SPK.OP-133 (12313) - DAkkS calibration temperature cold water tank

- **DAkkS by a certified company incl. test certificate for the temperature sensor in the cold water tank.**

OPTIONS - SPK SERIES

SPK.OP-162 (12499) - Factory calibration flow rate IPX1/X2

- **Factory calibration by iTS GmbH incl. test certificate for the flow meter of test IP X1/2**

SPK.OP-160 (11891) - Factory calibration of sensors for IP X3/4

- **Factory calibration by iTS GmbH incl. test certificate for the flow meter and pressure sensor of test IP X3/4.**

SPK.OP-170 (11892) - Factory calibration of sensors for IP X5/6

- **Factory calibration by iTS GmbH incl. test certificate for the flow meter and pressure sensor of the IP X5/6 test**

SPK.OP-180 (11893) - Factory calibration of the sensors for IP X9K

- **Factory calibration by iTS GmbH incl. test certificate for the flow meter and pressure sensor and temperature sensor of test IP X9K**

SPK.OP-163 (14759) - Factory calibration temperature cold water tank

- **Factory calibration by iTS GmbH incl. test certificate for the temperature sensor in the cold water tank.**

SPK.ZB-010 - SPK.ZB-040 (11896 - 11899) - Swivel tubes for IP X3/IP X4 test

- **The swivel tubes are available in different sizes. → The appropriate size must be selected depending on the SPK size and test specimen size (required standard distance).**
- **With the iTS swivel tubes, the hole spacing between the nozzles is 50 mm in accordance with DIN.**
- **The nozzles supplied have a diameter of 0.4 mm.**
- **The jet direction of each nozzle can be adjusted via a ball joint.**
- **When installed, the swivelling tube can be flushed with compressed air at the touch of a button after each test; the nozzles can also be removed for cleaning purposes and replaced individually if necessary.**
- **The axle lengths on the swivel tubes are adapted to the selected cabin size.**

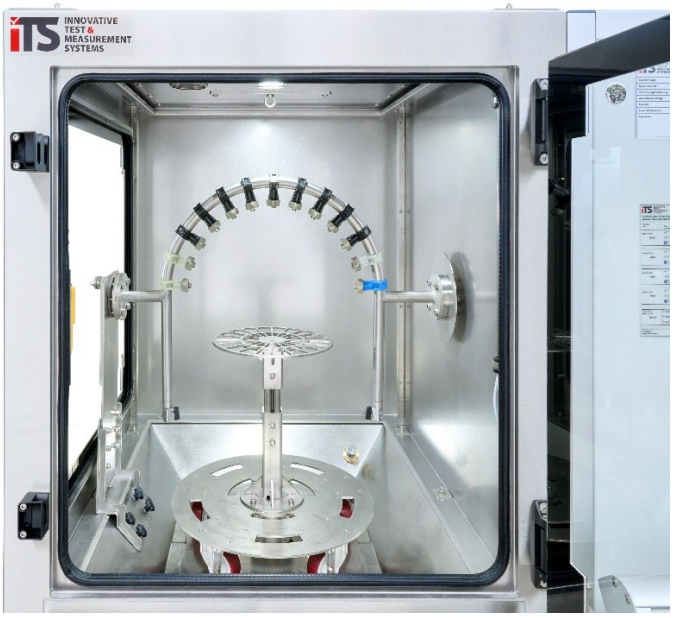
Photomontage: Possible swivel tube sizes in an SPK R800

Accessory number	Accessories	Suitable for SPK	Checkbox
SPK.ZB-010 (11896)	Radius R200 swivel tube for IP X3/4	SPK 200 / SPK 400 / SPK 600 / SPK 800	☐
SPK.ZB-020 (11897)	Radius R400 swivel tube for IP X3/4	SPK 400 / SPK 600 / SPK 800	☐
SPK.ZB-030 (11898)	Radius R600 swivel tube for IP X3/4	SPK 600 / SPK 800	☐
SPK.ZB-040 (11899)	Radius R800 swivel tube for IP X3/4	SPK 800	☐

SPK.ZB-050 - SPK.ZB-080 (11900 - 11903) - Swivel tubes for IP X4K test

- **The swivel tubes are available in different sizes. → The appropriate size must be selected depending on the SPK size and test specimen size (required standard distance).**
- **With the iTS swivel tubes, the hole spacing between the nozzles is 50 mm in accordance with DIN.**
- **The nozzles supplied have a diameter of 0.8 mm.**
- **The jet direction of each nozzle can be adjusted via a ball joint.**
- **When installed, the swivelling tube can be flushed with compressed air at the touch of a button after each test; the nozzles can also be removed for cleaning purposes and replaced individually if necessary.**
- **The axle lengths on the swivel tubes are adapted to the selected cabin size.**

Accessory number	Accessories	Suitable for SPK	Checkbox
SPK.ZB-050 (11900)	Radius R200 swivel tube for IP X4K	SPK 200 / SPK 400 / SPK 600 / SPK 800	☐
SPK.ZB-060 (11901)	Radius R400 swivel tube for IP X4K	SPK 400 / SPK 600 / SPK 800	☐
SPK.ZB-070 (11902)	Radius R600 swivel tube for IP X4K	SPK 600 / SPK 800	☐
SPK.ZB-080 (11903)	Radius R800 swivel tube for IP X4K	SPK 800	☐



Interior view: R200 swivel tube in a SPK R200.

REMARK

We reserve the right to make design and technical changes in the interests of further technical development. This applies to the entire technical description.

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VERSION

Version	Reason for change	Released on	Released by
2025	New creation	07.03.2025	CM
2025-1	Correction value: depth of internal test chamber size	29.08.2025	CM